APPROACHES TO ANTHROPOLOGICAL ARCHAEOLOGY

Metal, Nomads and Culture Contact

The Middle East and North Africa

Nils Anfinset

ROUTLEDGE

Metal, Nomads and Culture Contact

Approaches to Anthropological Archaeology

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Preface

Working in an area of conflict is difficult in many ways and the history of the southern Levant has made place names a central issue in the current conflict, also with reference to archaeological sites. This is reflected at a number of sites which may both have an Arabic name, Hebrew name and an English transliteration where the spelling may alter from publication to publication. I have chosen to use the place names found in the major publications, without considering the religious or political connotations.

Similarly the place and sites names in Egypt and Lower Nubia also have a number of different ways of spelling. I have here used the names and spellings found in the major publications, though this may slightly alter from both the local knowledge and other publications.

A note on dates is also necessary as this work covers a large area with different traditions and also different ways of expressing dates in a scientific manner. Throughout the book calibrated BC dates are kept as far as possible in line with Hassan (2002), basically because the main material stems from the southern Levant where this is the tradition. However, in Egypt and Nubia there is to a large degree, particularly in the prehistoric periods and environmental studies, a tradition of expressing calibrated BP dates. In order not to lose the original BP dating, these have been kept here, though this is generally followed by some comments placing the date within a BC framework. In terms of politics and religion BCE could have been used, though I have here chosen to use BC, without any specific meaning other than as a framework for dating.

Lastly, a note needs to be made on the geographical regions used. I have tried as much as possible to use common terminology, though this has not been easy as different disciplines use different terms. However, when referring to the southern Levant I basically refer to Israel, the Palestinian Territories and Jordan, though also including Sinai. When referring to northeast Africa I have Egypt and Sudan in mind, although this is an extremely narrow geographical definition. The term 'Middle East' basically refers to a broad geopolitical region from Libya in the west to Iran in the east, and Turkey in north and Sudan in the south (cf. Anderson 2000). Sometimes, particularly in Chapter 5, the term 'Near East' occurs as it is used by some of the main authors, though implying more or less the same geographical region. However, Khazanov (1994) does have a slightly different, narrower definition of the term 'Middle East'.

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Introduction

The regions of both northeast Africa and the southern Levant witnessed a number of major cultural changes from about 5000 BC to ca. 3000 BC, which must be seen in a context of important, widespread changes in animal husbandry, agriculture, expanding exchange and interaction over vast areas. As various modes of living advanced, it initiated constant communication over enormous areas between different regions where ideas diffused. The use and development of exotic materials and other commodities was also initiated through progressive exchange or barter. Copper was probably one of several items that became slowly integrated into an exchange system between the southern Levant and northeast Africa, where pastoral nomads in various forms played a significant role. These cultural changes ended with the culmination of the Dynastic periods in Egypt and the development of urban city-states in the southern Levant slightly later, while the Nubian A-Group disappeared from the map just after the First Dynasties in Egypt were established. In many ways, the gradual transformations of the 5th and 4th millennia BC led to a totally new and different way of life and interconnections, developing the cultural setting known even today in large parts of northeast Africa and the southern Levant. Northeast Africa is here used in a narrow sense basically including Egypt and the northern part of Sudan defined as Lower Nubia.

The aim here is to make a synthesis of some of these cultural changes. In order to approach some of these transformations, a broad culture-historical perspective is needed to understand developments. This of course reduces the focus on specific, local features, at the cost of the wider regional and interregional setting. A local perspective on these processes may easily turn explanations and interpretations into local developments and innovations, without understanding the wider interregional context. Developments through the 5th and 4th millennia BC will be followed with reference to the introduction of copper and metallurgy, as well as the development of specialized pastoralism. Here, the focus is on processes and developments over a long period of time, and the aim is to challenge some of the earlier approaches to the regions discussed here, and provide insight and a synthetic framework which may be applied on a more general level.

Commencing with a discussion of several central analytical perspectives and approaches, including relevant aspects of secondary products, this is connected to approaches on interregional contact and economic systems. Central aspects of the material culture will then be discussed, as these have relevance for the classification and contextualization of the objects discussed. In Chapters 3 and 4, the culture-historical frame is set for Chapters 5, 6 and 7, but also discussed generally is the past and the present environment of the region. Chapter 3 in particular discusses central issues of the Late Neolithic, Chalcolithic and Early Bronze Age I of the southern Levant. In Chapter 4, the culture-historical setting of northeast Africa is discussed, from the Neolithic period through large parts of the 4th millennium BC in Egypt, Lower Nubia and the adjacent desert regions. From this point, the role of present day nomadic pastoralists is discussed in Chapter 5 in addition to the timeframe considered here, noting also particular cases where there are pastoral nomads in the present day. Further, the role of copper artefacts in both the southern Levant and northeast Africa is analysed in Chapter 6, discussing the metallurgy, as well as copper artefacts and their contexts. In Chapter 7, these issues are drawn together with consideration of contact and exchange in the 5th and 4th millennia BC. The increase of specialization and ritualization, and the role of copper both in the regions and on a comparative cross-cultural level, are discussed.

2 Perspectives and Approaches

This chapter discusses the analytical approach connected to the analysis of the early copper. It especially focuses on the secondary products of wool, milk and traction, as well as more analytical concepts connected to economic systems of exchange, material culture and technology. These not only refer to the metal and metallurgy, but also to new technologies connected to food production and adaptation.

Secondary Products and Nomads

One of the central issues here is the development and the implication of secondary products as it is argued these have significant and important effects well beyond the new products and technologies themselves. Andrew Sherratt's (1981) article, 'Plough and pastoralism: aspects of the secondary products revolution', points to a number of technological, biological and social implications and developments connected to the use of these new products and technologies. Among these new technologies are carts or wagons and the use of the plough, which will not be discussed here as this is not central to the material presented or the themes in focus here. At the same time Thomas Levy's (1983) article has a more specific contextual focus on the emergence of specialized pastoralism in the southern Levant with particular focus on the secondary products. Here, the focus is rather connected to the use and the implications of milk and wool, as well as, to a lesser extent, animals used for transportation and traction, especially in an agricultural setting. The use of milk and related products, as well as the use of wool, leads us to carefully consider the implications of these products in a wider regional and interregional context, in particular with the development of specialized pastoralism.

However, first let us turn back to the issue of milk, wool, transportation and traction. The development of milk and milk products is extremely important to the understanding of the growing economic specialization found at sedentary agricultural sites in the Levant and northeast Africa, in a context where specialized pastoralism develops.

Sherratt (1981:282–3) argues that the evidence of woollen textiles in the Near East is meagre compared to the evidence of the waterlogged bogs and lakes of northeast Europe

which occur from the mid 3rd millennium BC, suggesting that wool had developed not long before in the Near East. Reviewing the evidence of both linen and wool, McCorriston (1997) suggests that during the late 4th millennium BC there seems to be a major shift towards wool production. This also fits well with the evidence of spindle whorls from sites like Hacinebi Tepe in southern Turkey (cf. Keith 1998). Using the pictographic evidence from Uruk, a few early Dynastic sculptures and cylinder seals, and the Old Babylonian lists, Sherratt suggests that wool may have played a significant role in the extension of the urban networks in Mesopotamia of the 3rd millennium BC. The question is, however, are there other avenues of dating the utilization of wool? Strikingly, Sherratt does not consider other archaeological material to a great extent, such as large scrapers, spindle whorls and loom weights, although these may indirectly lead us towards a further understanding of the use of wool. However, we must be aware of the fact that spindle whorls and loom weights may have been used for producing plant-derived textiles using such as flax. Clearly, these artefacts may have been used for other purposes, although a standardization of spindle whorls, for example, may give indications of use. One issue is the actual production of wool. Another is the economic and social implications. On a social level, Sherratt suggests that an expansion of textile production leads to a predominance of males in agricultural activities, while women were left to spin and weave within the household production. As discussed below, wool, along with milk and milk products, must have been some of the prerequisites for developing specialized pastoral nomadism as a specialization in a wider economic setting. Without this know-how and these resources, the basic element of specialized pastoralism would not be in place. In other words, it would not be possible to economically use dry or semi-dry regions for other purposes than pastures connected to meat production.

Milk and related products are one of the main reasons for the new exploitation of animals, as well as new modes of living. Sherratt (1981) highlights not only the dietary advantages of milk, but also the problems of animals not especially bred for the purpose of producing large quantities of surplus and the practical and biological difficulties of limited tolerance of human populations to milk. Sherratt (1981:278–9) points to cylinder seals from the Uruk period of the late 4th millennium, which clearly illustrate milk products, as well as a later scene of milking on a frieze in the temple to Nin-Hursag from the First Dynasty of Ur dated to the mid 3rd millennium BC. The latter is especially interesting as it appears in a temple context, clearly pointing to the significance of milk—possibly in a ritual context. This has recently been attested by evidence from the Chalcolithic temple at Gilat and analysis of pottery residues. The picture here clearly points in the direction of a number of substances such as milk and olive oil with long traditions in cultic practices in the region (Levy 2006c). Other archaeological material includes pottery and pottery forms, which may point indirectly to the process of milking and the utilization of milk products. For the region considered here, Sherratt (1981, 1983) has on several occasions directed attention to the pottery forms of the Chalcolithic period of the southern Levant, with particular emphasis on the female figurine from Gilat bearing a churn on her head, which was found in what is interpreted as a sanctuary. In addition, rams or bulls with churns and cornets carried on their backs have also been found in contexts interpreted as sanctuaries (cf. Sherratt 1983:fig. 7.5). Again, as previously mentioned, we see a link to a luxury and ritual context which we later observe in Mesopotamia too. A difficult question to answer is whether the milk utilized came from sheep and/or goat or cattle. In regard to the southern Levant, it is tempting to focus on

sheep/goat milk rather than cow milk—this will become more apparent in a later chapter on pastoral nomadism. However, at this point, it is sufficient to know that evidence of the technology of milking is attested in the early part of the 4th millennium in the southern Levant and somewhat later in Mesopotamia. There is also another major difference in the regional contexts of these finds. The Chalcolithic of the southern Levant cannot be described as an urban society, but rather a village-based society with relatively few indications of social differentiation. The later Mesopotamian case is an urban example where there is increased social differentiation.

Consequently, milk products and wool are truly one of the preconditions or prerequisites for the development of specialized pastoralism. Without the utilization of these products, specialized pastoralism would not be possible and the drier regions would not have the same economic significance. However, is the development of these new milk products and wool coherent in time, or do they have different chronologies? This issue will be addressed later, when considering in greater detail the sites and archaeological material connected to specialized pastoral activities in the southern Levant and in northeast Africa, in addition to the spread of metals and metallurgical know-how.

This utilization of specialized pastoral activities inspires new and different settlement patterns, including sites in more arid regions, such as the Sinai Peninsula and the deserts to the east and west of the Nile, in this case. It is exactly this development in drier regions that would play a significant role in interregional trade and contact (cf. Sherratt 1976, 1981). As Sherratt (1981:286ff) points out, this coincides with an agricultural intensification, in addition to the development of specialized pastoralism based on milk and wool using different ecological resources and symbiotic social systems (cf. Barth 1956). There may be large differences in economic basis and adaptation between the southern Levant and northeast Africa, but Sadr (1991) has noted similar developments in northeast Africa, especially on the peripheries of Predynastic and Dynastic Egypt. Sadr's (1991) study of the development of nomadism in northeast Africa focuses to a great extent on the identification and the importance of nomadic groups operating in a symbiosis with and on the borders of state-level societies (cf. Barth 1956), possibly even before the development of such state-level societies. The important factor in Sadr's model is that nomadic societies are more often closely related to settled societies and cooperation, rather than conflict, as argued with the Naqada III and the Nubian A-Group (Sadr 1991:129). However, the implications of secondary products, in particular milk products and wool, are not considered with reference to specialized pastoralism. These issues will be readdressed later, but for now it is important to keep in mind the advantages as well as the symbiotic relationship developing between agriculturalists and specialized pastoral nomads, both with reference to village-based societies and, later, to state-level societies, creating contacts over large distances.

While there is a clear potential for interregional contacts, it is necessary to examine what this means to archaeology and how this has been applied previously. Are the developments that we see during the 5th and 4th millennia BC in the southern Levant and northeast Africa the beginning of an increased interregional interaction based on secondary products and the introduction of metal, which develops into a 'world-system' by the late 4th and early 3rd millennia in both Mesopotamia and Egypt? This brings us to another important part of this book: the development of economic systems and the relationship to the secondary products.

Economic Systems and Archaeology

> No world system is global, in the sense that all parts articulate evenly with one another, regardless of whether the role they play is central or peripheral. Even today, the world, more globally integrated than ever before in history, is broken up into important subspheres or subsystems... (Abu-Lughod 1989:32).

Though Abu-Lughod (1989) discusses the world system 1250–1350 AD before the European hegemony from an anthropological perspective, her argument may have relevance for how we consider systems, connections and indirect contacts in prehistory. During the late 5th and 4th millennia there seems to be a considerable development leading to the first complex societies, where exchange played an important role. However, this must be contextualized with reference to social processes (specialization, organization, mode of exchange, etc.) and technological achievements. Was there a core-dominating system developing during the 5th and 4th millennia in the southern Levant and northeast Africa, or are there other alternatives of interregional interaction? Do any relationships exist between these societies?

A prerequisite to answering these questions would be analysis of the region where social complexity is developing, in addition to the adjacent or neighbouring regions where increased social complexity seems to develop at a later stage. This will be achieved with a close examination of the introduction of copper to these regions, as well as the role of pastoral nomadism. However, it is necessary to first take a closer look at some central theories focusing on interregional interaction and what implications this may have for the analysis here.

Considering systems or other forms of interaction, a basic premise is that the societies of the 5th and 4th millennia BC cannot be viewed as closed, separate units. Archaeological cultures are modern constructions, as are modern cultures and these must be seen in relation to each other, whether they are modern or ancient. One needs to see the archaeological cultures in a wider social setting, which implies a focus more on factors bringing about cultural change. Additionally, it is necessary to consider a wider geographical setting in order to understand impacts and effects in several adjacent regions. One possibility is to try to understand the societies of the southern Levant and northeast Africa within a 'formative system', where the southern Levant and Nubia are supply zones to Egypt.

Trigger (1989:333) has argued that Childe, as early as 1928 with his book, *The Most Ancient East,* used a core-periphery perspective when he studied the economic interaction between the Near East core area and the European periphery. Many European archaeologists are therefore predisposed to accept Wallerstein's theory of world-system. He argues further that: 'This approach involves the study of large-scale spatial systems, assuming an interregional division of labour in which peripheral areas supply core ones with raw materials, the core areas are politically and economically dominant, and the economic and social development of all regions is constrained by their changing roles in the system' (Trigger 1989:332). The concept of world-system theory has been frequently used in a number of studies with modifications to Mesopotamian civilization, especially after 3000 BC (e.g. Lamberg-Karlovsky 1975; Kohl 1978; Alden 1982; Edens 1992; Algaze 1993; and most recently Stein 1999). It has been argued that the developments in Mesopotamia are part of a much larger system of cultures developing in the region, influencing both political and economic developments over large areas. The concept has also been applied to a number of studies outside Mesopotamia, especially on the Bronze Age of western Asia and Europe (Ekholm and Friedman 1979;

Kohl 1987; Kristiansen 1987 etc.). Recently the concept has been applied to eastern Africa as part of the Indian Ocean world-system (Mitchell 2005). Although this has been within a context of growing globalization, the emphasis on world-system theory has not gained any influence (e.g. Hodder 2001). However, one recent exception is Gosden (2004) who uses a long-term view on culture contact in a colonial perspective. Alternatively, the world-system theory focuses on connections and is a good alternative to particularistic explanations and theories.

Wallerstein's world-system is basically a theory of economic relationships of complex societies, where the economic periphery area is linked and exploited by the economic core area. Dark (1995:131) has suggested the model incorporates both Marxist and system theory elements and the theory has found many supporters in both processual and Marxist explanations in archaeology. For a Marxist approach, the issue was related, to a large degree, to domination, resistance and growing social inequality. It has been applied in various forms in Mesopotamia at an early stage, due to increased social inequality and the development of social classes. Much of the recent discussion has focused on *when* and *how* we may speak of a world-system (cf. Gunder Frank and Gills 1993; Wallerstein 1993; Wilkinson 1995a, 1995b; Chase-Dunn and Hall 1997). Strangely, the world-system theory or modifications on the theory have never really been used in the Levant and Egypt. This is likely to be due to political or methodological reasons, but may also be due to the strong impact of culture-historical archaeology, the extreme desire to establish archaeological cultures on the basis of pottery types (as a substitute for text), or a strong focus on settlement patterns, which have indeed led to the reduction of the importance of interaction between societies.

In order to approach the study of interaction between societies on a more theoretical level, Lamberg-Karlovsky (1985a, in Trigger 1989:332) has used the historian Braudel's concept of the *longue durée* to distinguish between gradually cumulative processes and periods dominated by alternating forces that transformed the social and cultural order in Mesopotamia and the Iranian Plateau. The *longue durée* has recently been applied to the southern Levant (Levy 1998c) with the assumption that socio-economic change can be understood in a long-term perspective. Warburton (2001:207) argues that little attention is paid to the specific character of events, such as for example, the introduction of secondary products and metal. However, Levy (1998a) is one of the few looking at a broad timeframe, although he lacks the interregional diversion where the southern Levant (or the Holy Land) is placed in a larger regional setting. In the Levant, it is impossible not to consider a wider setting in order to understand the short-term, medium-term and long-term socio-economic processes that Levy wants to focus on. More recently Levy and van den Brink (2002) have to a large extent discussed and analysed the use of both world-systems models and a local peer polity perspective of core and periphery Egyptian-Levantine, where the interaction phase is much less understood in the early than those that are seen in the late EB I and early EB II contemporary with the formation process in Egypt.

Stein (1999:27) has argued that the world-system theory has been attractive to archaeologists because it links politics, economics and geography into a coherent framework that may be applied on the development of complex societies on an interregional scale. Obviously, the theory has been applied mostly to societies and states after 3000 BC, such as, the Roman Empire, Mesoamerica and Mesopotamia, which has a significant and vast impact over large regions. In such a context, the world-system and a core-periphery relationship

is emerging along with the development of complex societies. In these cases, raw-materials have had a significant position, and the core region has had the ability to dominate the resources of the periphery. However, researchers have also raised serious objections on both theoretical and empirical grounds to the application of world-system theory (Stein 1999:30, with references).

Wallerstein's theory was initially an attempt to explain the formation and function of the European capitalistic system from the 16th century to the present. The focus is not on the state-level because this cannot be understood as an isolated system, but rather as a larger multinational system of political and economic integration—a world-system. In such a system, there is a high level of interaction, where trade is one of the main factors in addition to differences in population, resources and technology. This led some regions to become more powerful than others. Wallerstein's theory consisted of a strong and dominating core, the semi-periphery and the periphery (see Fig. 2.1). In such a system, the periphery specializes in the production of lower order goods, while the semi-periphery is the intermediary between the core and periphery, both in terms of geography and organization (Stein 1999:11, with reference to Wallerstein 1974:302). In other words, the core is strong and dynamic, while the periphery is weak and passive, being exploited and dominated. The range of the world-system is limited by transportation technology and communications and there is a fundamental asymmetry in the power relations between the periphery and the core (Wallerstein 1974:349). In this way, the core and the periphery are interlinked economically. Obviously, it is a given that there would be some sort of centre periphery relationship in a world-system, although these are not stable, especially in the long term, due to the tendency of centres of accumulation to shift over time. The problem is how to apply the concept of world-system to non-European and pre-capitalistic societies, especially in terms of archaeology.

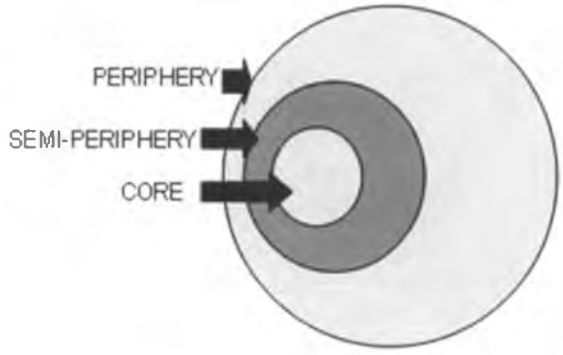


Figure 2.1 A simplified illustration of the world-system.

Although the theory of world-system is extremely general, the point here is not that the system did already exist in the 5th and 4th millennia, but that there was clearly social, technological and economic progress that led to greater interaction and contact. It is therefore, of lesser significance to study the core area, as the real interest lies rather in the local societies on the fringes of Predynastic Egypt and how this progress is expressed on a local level during the 5th and 4th millennia through the development of secondary products and the introduction of metal. It is also doubtful that such a 'formative system' resembled the modern system described by Wallerstein, although there are probably some general features

that are useful to consider in a prehistoric context. As Trigger (1989:333) argued: 'What is of general importance is the growing realization that societies are not closed systems with respect to neighbouring ones any more than in relation to their natural environment and that the development of a society or culture may be constrained or influenced by the broader social network of which it is a part.'

According to Stein's (1999) recent critique, the world-system theory is weak on a number of crucial points, both in general and when applied in archaeology. The fact that the core dominates and controls the asymmetrical exchange as the causal primacy of long-distance interaction structuring the political system of the periphery, has led Stein (1999:16) to argue that these assumptions eliminate or minimize the polities or groups of the periphery, and downplay the importance of local production, exchange and internal dynamics of developmental change. Drawing on ethnographic and historical examples, he suggests that the periphery must be seen as an active agent, where contact with the core may take a range of different avenues in terms of acceptance. Therefore, the theory fails to account for social, cultural and economic aspects in the periphery. Another problem is the assumption that the exchange system structure favours the core and exploits the economy in the periphery. Here, one assumes that a dependency of the periphery upon the core is created and maintained. There is no focus on mutual exchange and to which degree this contact or exchange transforms either of the parts, i.e. the core or periphery. In fact, as Stein (1999:24) points out, there is little evidence to support the idea that interregional exchange is the principal factor for socio-political change in the periphery.

When applied to archaeology and pre-capitalist complex societies, and with regard to the evidence from Mesoamerica, Mesopotamia, central Asia and the Near East, there is simply no clear pattern of core dominance in interregional interaction. Archaeological cases show that there is neither core dominance over a backward periphery, nor a technological gap between assumed centres and peripheries. In the case of metal and metallurgy in the southern Levant, the contrary seems to be the case, which will become clearer in the chapter on copper. As Stein (1999:34) argues, the theory is not very suitable for the constantly shifting economic and political landscape of ancient west Asia, which indeed is also the case for the southern Levant and northeast Africa. Thus, 'Given this variability in the impact of interregional exchange and the role of the peripheries as active agents in the system, one can no longer accept as given the world-system model's assumption that trade is the prime mover of social change in these areas' (Stein 1999:35). Stein therefore suggests a large degree of interdependence—rather than dependence. The consideration in this case is whether copper was so essential to the process of social reproduction in these societies that any interruption in its production or supply would break down the existing social hierarchy? Were copper artefacts used and introduced in other ways of social reproduction focusing on communal and common features rather than the specific? These are issues we will return to later, but are also important to consider on a more general level.

According to Stein (1999), it would not be possible to apply the world-system theory to the Predynastic and pre-urban societies of northeast Africa and the southern Levant, because the theory would be so modified that not much would remain of the theory itself when applied to archaeology, although the basic assumptions would still be implicit in the model. He further argues that when being made cross-culturally applicable, the construct is so broad that it's analytical value is ambiguous. However, there are also theoretical and methodological

developments based on 'world-systems', as we will see below with the approaches of those such as Sherratt (1999) and Stein (1999). Regardless of accepting the theory or not, one has to keep in mind that pre-capitalist and ancient societies operate on a fundamentally different basis from modern societies, and are therefore difficult to incorporate. Does this mean then, that economic systems did not exist previous to capitalistic societies? It would be useful to follow Abu-Lughod (1989) who looked at these systems as open and interlinked. Or as Curtin argues, 'Some observations from the recent past may then strike chords or suggest interpretations that may help us to understand the thinner evidence from the distant past' (Curtin 1984:14). However, Stein has suggested two alternative models, each with clear roots in the world-system theory.

Trade-Diaspora and Distance Parity Models

Stein (1999) has recently developed and used what he calls the 'distance-parity' model and the 'trade-diaspora' model as an alternative perspective to the world-system theory. Both models focus on the role of interregional interaction. The former suggests that there is decay in the ability of the core region to project its power over the periphery by distance and in the ability to alter the nature of the interregional interaction (Stein 1999:4). The latter describes and explains variation in exchange systems from a more individual angle, with foreign traders in host communities interacting with each other (Stein 1999:5). This presupposes that the host communities maintain their ties, both economic and social, with related societies of the same cultural identity. In contrast to world-system theory, he suggests that dominance and inequality are not implicit in the models. These models have been applied to a site, Hacinebi, which was in the periphery of Mesopotamian influence during the 4th millennium BC. At that time, the first urban states occur in Mesopotamia with great expansion into Anatolia. This expansion is partly due to the rich resources found in Anatolia and the growing demand for these in the Mesopotamian lowland. Stein identifies a precontact phase (Anatolian) and later a contact phase where a small number of Mesopotamians appear to have been living as a colonial enclave in the corner of the settlement (Stein 1999:5). He suggests further that the Mesopotamians did not dominate the local people economically or politically. The world-system theory, therefore, does not fit the material for Hacinebi, suggesting that we should study the local culture of the peripheries more closely. Here, he focuses strongly on not *a priori* assuming a hierarchy and the power structure of different regions in a network.

The distance-parity model generates cross-cultural mechanisms, and is based on economic rationality and does not incorporate cultural or geographical values, which may alter this static model significantly. Stein (1999:45) suggests that this two-track model may both focus on both general and historically contingent processes, and he suggests that the model should allow identification of cross-cultural mechanisms and processes that structure the interregional interaction. The trade-diaspora model takes into consideration intercultural exchange and interaction. Although it may be applicable in a number of cases, it is doubtful if it has any cross-cultural value, having, rather, a cultural specific or unique value. In advance, there is *a priori* assumption of at least two culturally distinct groups, but Stein does not engage in how this cultural difference occurred or upon what basis in the archaeological record. On the other hand, this model is also rather static in terms of parties involved in the

interregional interaction, and generally rules out a third or fourth part, such as for example, pastoral nomads. Further, the diaspora model suggests exchange along ethnic or cultural lines, although intercultural exchange also needs to be included.

Generally speaking, Stein's distance-parity model explain the case in the southern Levant and northeast Africa during the 5th and 4th millennia. As there were probably only 'small cores', with limited ability to exercise any power over larger areas, the control would decay with increased distance, implying more symmetry in economic and political relations with the 'periphery'. One major drawback of Stein's diaspora model is that the potential for exchange and interregional interaction must come from a core area and not from within the periphery. In this way, the periphery is made passive and less innovative than the members of a diaspora group. Although difference is the essence of the trade-diaspora model, this is not necessarily manifested in the archaeological material. One may question what Stein identifies as a trade-diaspora relationship, as there has been a process of specialization on the site, which would in turn make contact with Mesopotamia obvious. Signs of contact, such as Mesopotamian artefacts, were brought into households in an increasingly greater degree.

Zone, Zonation and Connectivity

Recently, Sherratt (1999) has focused on the paradox of the cash-crop concept in pre-cash, prehistoric societies and its role and position in a world-system. He argues that not only timber and dyewood should be incorporated, but that the outer edges of the world-system should be characterized by the exploitation of also other natural resources, where value is added close to the centre.

> as the system grows and differentiates, it develops a zonation in which native populations are used as intermediaries in the outermost zone in exploiting primary terminal products, though a zone in which unfree labour is used in exploiting secondary live products, to an inner zone in which skilled (though often dependent) labour is used to add value to the products of the other two in a variety of manufacturing processes (Sherratt 1999:19).

In this system, he suggests that the outermost zones largely produce raw materials, the middle zones produce half-finished commodities, and in the inner zone, fully manufactured products are produced. The latter are characterized by both technological and spatial knowledge, as well as a web of contacts. As argued earlier in this section, it is exactly in these nuclear areas of early civilizations that these systems emerge. Typically, there are contrasting ecologies and ecological zones where exchange can easily occur (Sherratt 1999:20). This is a pattern that may not only occur in Predynastic Egypt, but also partially in the southern Levant and Lower Nubia, and in the earlier phases of such systems where there may have been loose connections between the different zones. Therefore, Sherratt (1999:20) suggests that the formation of early states was often accompanied by the development of semi-independent, opportunist, mobile populations which exploited different ecological zones.

What comes out of this is a wider network among ancient societies, a network which is not too dissimilar to modern and historical networks (cf. Braudel 1972, 1995; Castells 1996, 1997, 1998). This increased focus on networks and globalization in general has also lead to a similar research focus in archaeology and related disciplines on long-term historical processes (cf. LaBianca and Scham 2006). Although the aim here is not to point towards a globalized

world as we know it today, there are certain long-term processes in the periods discussed here that had a fundamental impact for several millennia. However, the scale would have been totally different from the present, nevertheless significant. In other words we may view the societies and people considered within the timeframe here just as globalized as today—though on a different scale. People *did* communicate across large regions in prehistory as well, but this also means that we have to move away from the stereotype of archaeological culture. As LaBianca and Scham (2006a:7) using Castells concept of 'space of flows' which on a small scale considers information and transactions transmitted without physical proximity. Here not only knowledge of metal, but also agro-pastoral technology were of importance to greater connectivity in the 5th and 4th millennia (cf. Levy 2006a), although keeping in mind that people did exchange these ideas and knowledge. In this context Levy (2006a:23) not only focuses on technology but also on other factors of culture that promote social reorganization and change, suggesting that technology has a momentum of its own.

During the 5th and 4th millennia, it is here argued that this was represented to a large extent by nomadic pastoralists who had the possibility and the knowledge of taking part in this exchange. In the latter quarter of the 4th millennium and the early 3rd millennium, structural and technological changes took place, shifting from pastoralist to direct exploitation by sea people or merchants. These 'middle-men' or 'middle societies' lost their position where they had earlier had the possibility of accumulating wealth in a region not giving many other possibilities of economic surplus. Their benefit had been the knowledge and contact with societies to the south and northeast, and they had used their geographical position and knowledge of the environment to develop this position throughout the 5th and 4th millennia BC.

'Big-men', Entrepreneurs and Exchange

In this context of zonation and connectivity over large parts of the Middle East, there must have been groups of people and societies who saw the *potential*, not only in new products and technologies such as copper, but also the growing demand for other luxuries and consumables. This implies that certain regions and groups had the possibility and advantage of technological and economical changes. In this respect, it is valuable to explore the concepts of 'spheres of interaction' and 'entrepreneurs' used by Barth (1967) in his study of the Fur in Sudan. These concepts are more dynamic than the traditional interaction sphere, which is bounded by spatial constraints, although it considers the effects of interregional contacts, as suggested by Robert McC. Adams (1974:243). Barth's concept, on the other hand, is less spatially defined and may overlap. It contributes more to the analysis of processes, however, and is less regionally oriented with reference to the description of raw materials and associated patterns of distributive behaviour (Adams, R.M. 1974:243). Barth (1967) suggests that the flow of goods and services is socially patterned in discrete spheres, where social barriers exist, preventing free movement between different spheres. This is a pattern we can identify with the spread of copper both to the southern Levant and slightly later to northeast Africa as we will see in Chapter 7. In this regard, entrepreneurial activity develops and clusters along these barriers in order to take advantage of the relatively scarce means by which the barriers may be breached (Adams, R.M. 1974:243). Barth (1967:171) suggests that 'entrepreneurs will direct their activity pre-eminently toward those points in an economic system where

discrepancies of evaluation are greatest, and will attempt to construct bridging transactions which can exploit those discrepancies'. As R.M. Adams (1974:243) points out, these processes are methodologically difficult to approach, but this also depends on the examination of larger archaeological assemblages in order to understand contexts where entrepreneurs may have developed. In other words, the entrepreneur is an innovator who is able to see the shift of demands and takes the opportunity. The introduction of copper metallurgy and artefacts, as well as secondary products, required more skill and labour, which indeed would increase specialization in a society supplying others with such goods. Another consideration is that this exchange may have been developed between groups who were not morally bound to each other in terms of kinship and friendship. 'Big-men' are such entrepreneurs, who achieve prominence by their skill as manipulators. In periods of unstructured and formative urban or dynastic societies, such as that of Predynastic Egypt, there were no clear borders but there were more flexible relationships and interregional interaction, creating possibilities of entrepreneurial management.

What is important in such a context is that one must have the ability to function in and between two different social systems. Therefore, exchange may often have had a third party, which had the ability to operate inside and outside different societies. Stein (1999:49, with reference to Azarya 1980) argues that many agrarian and pastoral societies view exchange as a suspicious activity best left to outsiders or socially inferior groups. This view is rather narrow and static. On the contrary, pastoralists are useful 'mediators' between the settled world and the resources in the periphery that they desire. Such groups must be seen as complimentary to the exchange that they were practising themselves. Stein (1999:46) emphasizes the impact and importance of exchange and argues that it is the most common and important form of interregional interaction. He points out further that exchange may take different forms, such as (a) indirect, down-the-line exchange, (b) direct exchange under local control, and (c) exchange networks characterized by trade colonies or diasporas (Stein 1999:73).

In this respect, raw materials are of central importance and it is obvious that the knowledge of these and the maintenance of control over resources played an important role in the exchange system. To a certain degree, the resources may also have been bound to environments, which were difficult for settled societies to approach. In this way, access to luxury or exotic goods is a simple way to construct power.

> In these negotiated transactions, particular social actors or groups stand to gain a competitive advantage, particularly where they can control the flow of goods and more particularly the process of adding value by creating more complex products with special social meanings through their association with rituals and offerings (Sherratt 1999:21).

This has probably many similarities to the social and economic processes of the Chalcolithic societies of the southern Levant, especially in the Beersheba region, as well as on another scale (but with similar processes) in Lower Nubia because they both appear as patterns of local specialization, where accumulation of wealth was made possible.

Formation of Middle Range Societies?

Now, connectivity, entrepreneurs, zones and large exchange systems demand some sort of explanation to what kind of societies we refer to here. Implicit here is that there is a growing

tension between equality and inequality in the social system. Particularly for the Chalcolithic period of the southern Levant where Levy (1998) has suggested the development of complex chiefdoms with satellite settlement in a two-tier system, and more recently applied the term 'middle range societies' in connection with religious practice and control at Gilat (Levy 2006b). The term 'middle range societies' has an evolutionary background and frame, as it refers to the great diversity of 'pre-state' sedentary societies (cf. Feiman and Neitzel 1984; Upham 1987). However even the term 'pre-state' suggests evolutionary connotations, as these societies are considered to be on the threshold of state societies. This, of course, is also part of a larger debate on how state organizations develop. This is an issue related to exchange systems, entrepreneurs and the development of social inequality. Further it is necessary to keep in mind what R. McC. Adams has recently argued for the case of southern Mesopotamia: 'In summary, there are grounds for doubting that individuals of chiefly status led the way to states' (Adams 2004:43). Further, as Rousseau (2001) points out, these middle range societies are not a social type as they are extremely variable in size, although much of the research on this has focused on large polities (e.g. Earle 1991). Here it could also be useful to keep in mind Gledhill's view of complexity:

> The notion of 'complexity' is sometimes restricted to the social transformations associated with political change: 'class', 'status', and 'cast'. But it really shades into the broader sociocultural dimensions of change processes, such as the development of urbanism and transformations in religious organization and intellectual life' (Gledhill 1988:7).

As we see here the issue is much larger than it is possible to deal with here to any extent, though we should keep in mind that the processes that take place in both northeast Africa and the southern Levant are the beginning of increased specialization, both technological and economic, within and outside the household, which in the long term demand different and new social institutions. In other words it is necessary to look at the social and economic organization and how this is related to other aspects of the society.

Cultural Contact and Cultural Change

Schortman and Urban (1992:11) point out that there has been little interest within the evolutionary and cultural ecology paradigm in interregional interaction, while later trends, such as historical particular frameworks and post-processual archaeology, have paid more attention to this topic. More recently, they have also discussed various forms of cultural contact between different systems (Schortman and Urban 1998). The issue of cultural contact usually has the form of acculturation or world-system, where domination and control are central themes. In a process of growing complexity, exotic goods and raw materials would often be used in strategies to maintain social inequality, and here, the possibility of controlling such goods would be important. This would certainly depend on intercultural entrepreneurs who see the relevance of long-standing contacts and networks, where local leaders or specialists may be middlemen. However, changes or innovations in technology may easily alter these structures. What is important here is that there are individuals, not cultures, who generate and interact, but the result is cultural and interregional contact.

Edens has argued, with reference to Mesopotamia, that

> The qualified rejection of 'world-economies' in the pre-capitalist context should not deny the wider framework of its conception—the complementary of centres and peripheries, the multiplicity and the richness of the connection between these two categories of societies, and the benefits of this perspective in approaches to ancient social history' (Edens 1992:121).

This leads to consideration of contact between regions or areas of coexisting societies, with different levels of development. It is also highly probable that there were different societies living side by side, or within each other, based on different economic modes of production or different social value systems. This implies that societies of different economic bases influence each other, through competition and mutual dependency, creating a base for major cultural change. Further, this means that ecology or technology should not be ruled out in a context of cultural change. Transformations, as a result of interaction between different societies, may also be an avenue of cultural change and therefore more complex to study. Within the research of the southern Levant and northeast Africa, a mixture of culture-historical and processual archaeology has focused on cultural change within an evolutionary or neo-evolutionary perspective and explanation. One significant factor developing along with the evolution of complex societies was the growing interregional interaction. Stein (1999:4) has argued that this is a balance between the fact that no society can be understood in complete isolation from its neighbours and that contact with the outside is the main factor explaining a society's development. Stein (1999:46) is correct when he argues that there needs to be greater focus on how interaction works at the point of contact between different parts in a larger network, including their power relations, which structure the organization and control over interregional exchange and interaction.

Social Differentiation and Specialization

Much effort has been put into understanding the development of complex societies, especially with reference to what we call civilizations. However, studying the development of early civilizations often brings us into a situation where we must also understand what happened *previous* to the actual civilizations. There has been much focus on internal factors and dynamics, while few external factors or explanations are considered. Of course, in a context of nationalism and emphasis on unity and borders, it is easy, natural and significant to downplay external factors. The development of agriculture led to fundamental changes in human societies as populations grew rapidly. There were changes in subsistence patterns, as well as in technology, which resulted in changes in social organization and political relations. Civilizations often imply early class-based society, with a high degree of social and economic inequality, and the power to control agricultural surplus (cf. Trigger 1993:6–7). There has been a trend to focus more on external factors in larger systems and the process of interaction as significant factors in social change and development (Trigger 1989:330). It is not the intention here to discuss various theories and approaches to the development of complex societies, but rather to examine the role of specialization and social differentiation in these formative societies, when new technologies and products are introduced.

As Stein (1999:1) points out, for more than a century, researchers have debated the degree of different forms of interregional interaction, such as war, trade, migration, diffusion of ideologies, etc. which have influenced the development and formation of specialized and

hierarchical polities. Wittfogel (1974) focused on the control of irrigation systems, Carneiro (1970) addressed population growth and conflict, while Butzer (1976) argued population pressure did not play a significant role in the development of complex society, because Upper Egypt, with its rapid development, was an area which demanded less effort than the Lower Egypt. According to Stein (1999), the principle of a strong urban core dominating the less developed periphery has been the dominating view, especially over the last decades with the world-system theory and various modifications applied to archaeology. The theories on development have been based on complex societies, many of which stem from an evolutionary framework, especially in the work of Sahlins, Service and Fried, etc.

Renfrew (1986) has suggested for Europe, that the introduction of metallurgy and the expansion of trade created social changes on various levels. However, the point at issue is essentially if metal and metallurgy were integrated into existing forms of social organization, or if this created new forms of social organizations. Chiefdom has been used as a form of organization in early complex societies (e.g. Gilman 1981; Earle 1991), especially in the southern Levant, applied by Levy (1992, 1998a) and Joffe (1993), although this has been disputed by Gilead (1994). In the southern Levant, Golden (1998) has suggested a relation between the emergence of social complexity and the introduction of metallurgy. The issue of social differentiation and specialization is also significant for understanding early Egypt, though this has had much less focus compared to the southern Levant. However, it is necessary to use a long-term, spatially large perspective to understand these cultural processes (e.g. Wenke 1989; Trigger 1993, 2003). Alternatively Blanton *et al.* (1996) have suggested a more corporate strategy, where there is more emphasis on the communal and collective issues when wealth and prestige are lacking. With reference to metallurgy and technology, it is necessary to separate the social organization of production and the social organization of specialization.

In this way specialization, secondary products, systems, interaction and cultural contact are all aspects of a single phenomenon. The main emphasis is how we consider and approach archaeological material in general. It is, therefore, also necessary to study some issues that are on a more basic level connected to meaning, form, function and context in archaeology. This is not only important for how we look at the introduction of metal to the regions discussed, but in fact to how the new technologies and products are introduced.

Material Culture: Context, Function and Form

> Material culture is the name given to the man-made physical products of human behaviour patterns (Spier 1970:14, in Lechtman 1977:6).

It is not sufficient to use Spier's definition of material culture if one does not additionally incorporate how material culture is put to use, and what ideas and meanings are associated with it. It is, in other words, necessary to consider the social environment in which these physical products are produced and used. When we approach interregional contacts, nomads and metal, material culture is the basis of our investigation. It is tied to contextual aspects, as well as function and form, establishing links and understanding.

Hodder (e.g. 1987) has for the last two decades been a leading exponent stressing the use of context, meaning and symbolism in archaeology, and incorporating symbolic and cognitive

aspects of archaeological interpretation. This came as a reaction to processual interpretations in archaeology, where material culture was merely looked upon as a passive reflection of human behaviour and its environment. Recently, there has been an increasing interest in the investigation of how material culture in daily life may generate social meaning. It is important to stress the context to develop a link between the object or the material culture and a situation. Contextual archaeology focuses on the function of the object, the structured ideas and the symbol represented by the object, which is linked to a situation, either particular or several (Hodder 1991). The meaning may, in other words, change according to the situation or context. How artefacts are made or how technology is understood depends on the cultural perception, where technology is linked to social aspects, such as cosmology, gender roles and the use of space. These are issues we will consider not only with reference to metallurgy, but also with reference to the development of secondary products, such as wool production.

As argued above, context is significant in order to make a broader understanding and interpretation of artefacts, as well as technological processes. Analysis of contexts ought to play an important part in interpretations in general, as the archaeological context provides us with a possibility of understanding social factors as well. Hodder (1991:143) defines the context as 'the totality of the relevant dimensions of variations around any one object'. It is, however, striking that few have discussed these 'relevant dimensions of variation', and the term 'context' may easily be used uncritically. This may in turn affect the result of the analysis negatively. Obviously, much depends on the questions we ask and what we define as relevant. Hodder (1991:149–50) argues further that 'a contextual analysis involves moving back and forth between theory and data and trying different theories to see which accounts for the data best'. He emphasizes the need to explore and understand the different contexts of an artefact or activity. However, in recent contextual studies, a tendency can be noted to confuse the physical archaeological context with the social context. These contexts are related, but not necessarily identical. Artefacts can be used in a social context in the past, either one or several, but as we excavate, interpret and reproduce them, the artefacts become part of a new social context. This gives us an understanding of the combinations of artefacts, the technological processes as well as the relevant social dimension. In this way we may gain an understanding of the role of copper when it is introduced, as well as the symbolic meaning of copper in a wider social setting, with reference to interregional contacts and exchange.

Material culture can, in a given context, give us information about different values and ideas in a society. Meaning is constructed within society and cultural frames structure human behaviour. Human behaviour generates meaning for the material culture in the social space, and thus artefacts can achieve a social meaning through its users and in the context of use. By focusing on the meaning of the artefact, it is possible to understand its social importance and value. The material culture expresses a social message in this way, and by studying the material culture, as well as the social setting, it is possible to understand the social expression of technology, style, space, gender relations, etc.

The functional qualities of artefacts have always been central to archaeology. On a more general level, however, the concept of function became especially central to the processual paradigm, which aimed at explaining various aspects of culture based on causal explanations. Obviously, function is still a fundamental aspect of artefacts and interpretations, but this needs to be connected to a wider social setting. A purely functional study would only investigate how these variables are connected together, not how they contribute to the totality as an

integrated whole in mutual dependence. Function and symbolic meaning were often totally separated in processual archaeology, but as argued elsewhere with reference to technology, it is difficult to separate purely functional aspects from symbolic aspects. Not only the technological processes, but also artefacts, and in this case copper artefacts, consist of causal explanations referring to input, output, chemical composition and function. This needs to be related to a wider social setting of the technological processes, as well as the functioning of the artefacts in general. As we will see here, it is not just a question of producing copper, but it is as much a question of what makes it 'copper' in a cultural sense. This would, indeed, imply an understanding of the role and the function of copper with reference to interregional contacts, belief systems and identities, as well as how copper artefacts have a utilitarian or rather functional purpose.

Form has a long history in archaeology, and has been used to establish typologies on which modern archaeology is founded. Earlier, form or style was related to groups or ethnic groups, and these archaeological 'cultures' were created based on topographic differences which differed both in time and space (cf. Childe 1925). Form is also regarded as a clearly defined area, or the shape or spatial limit of an artefact. More recently, style has been used as a link between archaeological remains and the social context, to make the past accessible and provide new insights and interpretations of the past. The concept of style may refer to groups or boundaries, information about the user, choices of the artisans or symbolic expression of social information (cf. Haaland 1977; Sackett 1982; Hodder 1982a; Conkey and Hasdorf 1990). This implies that style is a cultural indicator, where similarities in decoration, tools and technology are often used by people of the same cultural knowledge. Of course, style in this case, can also be a way of expressing ethnicity or other social stigmas, but it is not enough to look at function and utility only, as the social environment must be incorporated as well. It not only defines status, identity or ethnicity, but the entire technological process.

From this point of view, early copper metallurgy, and the depositional context of copper artefacts, consists of a range of choices within a cultural frame expressing values and ideas. The products are, in other words, a result of the learned knowledge of the technology and may therefore reflect the social environment and the context in which it is produced. These factors constrain the form and the function of both the technological process and artefacts. As we will see, for the early smelting and use of copper artefacts, there seems to be certain values and ideas vested. However, these are implicit and not understood without reference to the wider social context. On the other hand, this is not only connected to metal and metallurgy, but it is also significant for understanding the development of secondary products, both on a technological and social level.

Metallurgy is often considered in terms of physical and chemical reactions, especially with reference to tracing artefacts and smelting debris back to their origins. However, it is equally important to consider the social context of these activities. This challenges the positivistic and empiric approaches (cf. Gibbon 1989), which are based on repeated observations in the search for directly observable and measurable features for the archaeological record. As we know, in the classification of archaeological material, observations are often presented in a 'correct and value-free' manner, in spite of sufficient doubt or assignment of artefacts to the wrong categories. As most researchers are aware, the premises for research changes constantly, both on a technological level, due to the complexity of human nature and indeed within the conditions and contexts of research institutions or more nationwide directives for research

schemes. Consequently, while archaeologists deal with human remains very thoroughly, they do not deal with human phenomena or human interaction in the same way. This is of course, due to methodological considerations, because human conditions or interactions are generally observed only once and because of the natural fact that this is not directly traceable in the archaeological record. Therefore, an interpretation of prehistory (or history) cannot be objective. This does not invite a speculative archaeology, as arguments must be based on theoretical and methodological premises and conclusions must be stringent and reasonable. Interpretations may, therefore, be plausible and tentative, but not necessarily valid in every situation. When considering archaeology, the essence is whether nonobservable processes and cultural traits should be part of the archaeological interpretation or not. Understanding human interaction in present situations is indeed different from past situations. Assuming a common core is present one may presume elements of general interest in all human interaction.

Now, as we have set the basic premises of the issues central for the discussion here, it is necessary to turn to the picture of the southern Levant in the 5th and 4th millennia BC before discussing the material in greater detail.

3 The 5th and 4th Millennia BC of the Southern Levant

This chapter presents the context for the material in Chapters 5 and 6 connected to nomadic pastoralists and the types and contexts of copper artefacts. Included is a brief discussion on the past and present environment, together with the earlier research, approaches and understanding of the periods covered here. What is significant is that, although there is a high discrepancy connected to terminology and chronology, there is a growing focus on agricultural specialization, including pastoralism, throughout the 5th and 4th millennia.

The Present and Past Environment

The area of the southern Levant covers a large and differentiated geographical region within small areas and distances, creating a mosaic of diversity in the present environment. These differences have, of course, occurred and developed through special climatic and geological features that have developed over millions of years in combination with long-term human usage of several millennia. There have been several major changes so that the present environmental features may differ significantly from the prehistoric environment.

In any understanding of prehistoric societies, it is necessary to take into consideration environmental factors. However, vegetation of prehistoric periods cannot be understood without reference and knowledge of the modern vegetation in relation to climate and edaphic conditions (van Zeist and Bottema 1991:14). The following is a brief and basic overview of the present climate and the assumed natural vegetation regions, in order to give a basis for understanding the societies of the southern Levant in the 5th and 4th millennia.

The geological evolution of the Middle East with plate movements, faulting, volcanicity, emergence and submergence, together with a shifting climate has produced a complex geology of the region (cf. Wilkinson 2003). The outline of the region today has been the result of millions of years of geological activity and, especially significant, is the transformation fault of the Jordan Valley between the Arabian and African plates. This fault and other geological transformations have shaped the landscape of the region, factors that were also significant

during the later prehistory. Hennessy (1969) has pointed out that the Chalcolithic site of Teleilat Ghassul (hereafter Ghassul) in the Lower Jordan Valley was subject to frequent seismic disturbances and several earthquake splits were discovered (see Hennessy 1969:fig. 3 and plate IVa). The current landforms are not only a product of past geological activity, but also reflect current geomorphological processes. Run-off generated by intense rains of short duration can be more devastating in regions where the landscape is unprotected by vegetation.

The determinant landform in the Middle East is present-day aridity or hyper-aridity combined with the effects of previous 'pluvial' periods. This has resulted in a number of distinctive landforms such as slopes from mountain to plains with their covering and mass movement of features, wadi networks in mountains, foothills and plains, and dune fields or sand seas formed aerodynamically (Anderson 2000:24).

The varied geological and topographical features of the region are also reflected by the climate, which varies considerably, even within extremely short distances. It is also clear that there have been substantial changes and differences in climate over time. Except for the coastal plains of the Levant with its temperate and rainy climate, the remainder is usually considered to be a dry climate with variations. Most of the southern Levant today receives less than 100 mm of annual rainfall (see Anderson 2000:fig. 3.7). Some areas within this region may not even receive annual precipitation at all. As an example, the coastal plain and the mountains do not exceed 1000 mm of rain (van Zeist and Bottema 1991:18), while the Dead Sea is found at almost 400 m below sea level and receives less than 250 mm of rain. The coastal plain and its adjacent foothills are characterized by mild, rainy winters and dry, warm and hot summers with a precipitation between 350 to more than 1000 mm annually (van Zeist and Bottema 1991:20). The temperatures of the region vary, but are characterized by high summer temperatures although this depends upon the altitude. There are large differences between the Central Hills on what is today the West Bank and Jericho, which is situated only a few kilometres away down in the Jordan Valley 250 m below sea level. Today, much of the southern Levant consists of desert zones, including the lower part of the Jordan Valley, the Negev and Sinai. In the southern Levant, the coastal plains are represented by Mediterranean-type vegetation. The narrow coastal strip along the eastern Mediterranean with this type of vegetation usually has a relatively wet climate and is well suited for plants, such as vines, wheat, olive, fruit trees, in addition to a large number of shrubs, herbs and evergreens (Anderson 2000:67). To the east of this, there is generally Irano-Turanian vegetation, or steppe vegetation with wide seasonal variations of temperature and a lower general rainfall than the Mediterranean (Anderson 2000:67–8). The Sinai, Negev and the lower parts of the Jordan Valley represent a Saharo-Sindian vegetation type, though with great variations within that. Today, only part of the southern Levant is covered by the 250 mm isohyet, excluding the Sinai, Negev, Beersheba and the area slightly north of the Dead Sea (see Fig. 3.1).

Climatic change is often connected to changes in the adaptation of societies, which may also reflect a change in settlement pattern. There is, however, not necessarily a direct link between the two, though in more marginal areas small changes may trigger both changes in the settlement pattern as well as developing new technologies and economies. In the case of the southern Levant the Dead Sea is of particular importance, as it is possible to compare climatic indicators with the regional settlement pattern during the periods from Late Neolithic to the early Bronze Age (Goodfriend *et al.* 1986:354). However, the dates vary slightly due to more refined dating methods, but also the material used for dating. The Natufian deposits at Tell

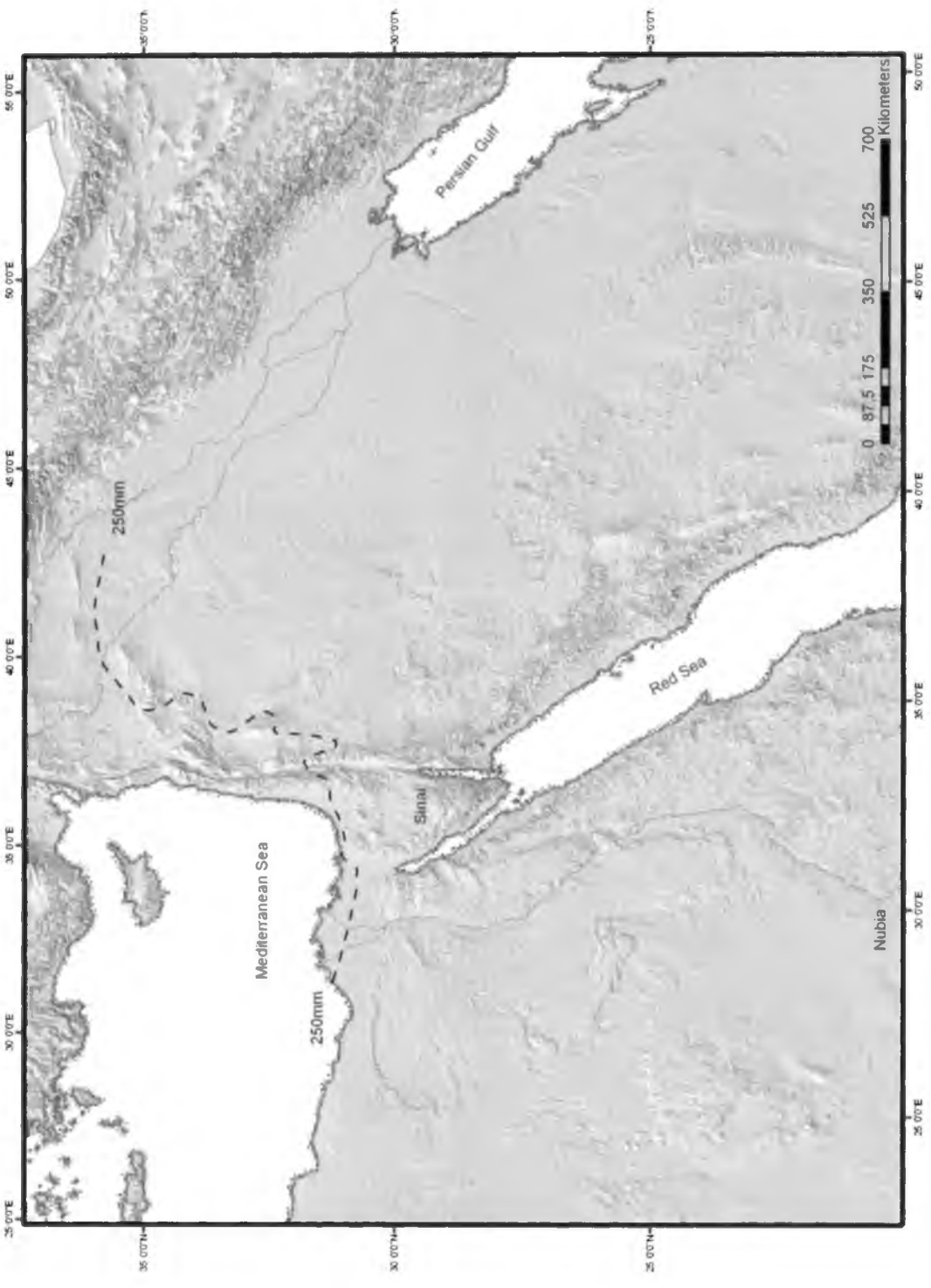


Figure 3.1 Approximate extent of the 250 mm isohyet in northeast Africa and the southern Levant.

el-Sultan in Jericho have been dated to approx. 11,200 BP and have provided a minimum age for the lake retreat of the Dead Sea/Lisan Lake. Goldberg and Rosen (1987:25; with reference to Neev and Hall 1977:2) suggest that the Lisan Lake ended about 13,000 to 11,000 BP, and was followed by a pluvial period, reflooding the basin at about 10,000 BP lasting until about 7,000 BP. Neev and Emery (1967) presented at the time a relatively detailed sequence of the climate based on Dead Sea sediments over the last 10,000 years. They identified the Neolithic-Chalcolithic transition (6500–5500 BP) relatively arid, while the previous and later periods down to the Middle Bronze Age (*ca.* 4500 BP) were more humid. These dates have now been refined (cf. Neev and Emery 1995:59–65) with the first wet phase staring *ca.* 15000 BP and ending about 7800 BP. A second wet phase started from 7800 BP and ended about 3900 BP, with two wet subphases at 6300 to 6000 BP and 4900 to 4650 BP. Of significance here is the first wet phase, as it would correspond roughly to the first half of the Chalcolithic period. From this point of view sites like Ghassul and Beersheba can be explained as it would be possible not only to pursue dry farming in these regions, but it would also open other regions for less intensive use in terms of pasturing animals. This evidence is supported by Goodfriend (*et al.* 1986; Goodfriend 1991, 1992) where the oxygen isotope values of land snail shells changes from 9000–7300 BP and 6500–6000 BP. These changes are connected to patterns of more humid periods, and Goodfriend (1991) argues that these changes are connected to changes in rainfall rather than temperature, which in fact would press the isohyet further to the south and into the arid regions of the Negev and Sinai (Goodfriend 1990).

Sites from the Chalcolithic period in Negev and the Beersheba Valley are generally covered with a varying degree of thick Aeolian loess and loessial deposits, and evidence from Shiqmim is interfingered with 4-5 m of alluvial silts (Goldberg and Rosen 1987:26). Alluvial deposits on the southern bank of the wadi suggest that it was actively aggrading its channel during the Chalcolithic period, something which is also found at other wadis in the region and points towards a substantial alluvial activity during this period, indicating wetter conditions than today (Goldberg 1987; Goldberg & Rosen 1987:26–7). This points in the direction of wetter intervals between 9000–7000 BP (*ca.* 7000–5000 BC) and around 5500 BP (*ca.* 3500 BC), separated by a relatively drier interval between 7000 and 5500 BP (Goldberg and Rosen 1987:29), which is also supported by faunal remains (Grigson 1987). Van Zeist and Bottema (1991:113–14, fig. 40) have reconstructed the vegetation of the southern Levant 5000 BP, where most of the Central Hills were dominated by forests, not unlike that of today, although human influence is not taken into account. By 4000 BP (*ca.* 2000 BC), the present-day distribution of forests, woodland and steppe had established itself (van Zeist and Bottema 1991:125). In general this points in the direction of a warmer and presumably drier climate during the Late Neolithic Period, although there was an increase in rainfall in the most southern parts of the southern Levant probably also changing the economic system towards greater emphasis on agriculture and pastoralism (cf. Issar 2003:14–15). This was probably connected to a northward shift of the monsoon belt (cf. Street-Perrot and Perrot 1990; Gasse and van Campo 1994), which also had a cultural impact on other parts of the world including northeast Africa (cf. Hassan 1997, 2000). This made it possible to settle and practise agriculture in semi-arid regions, though those areas were extremely vulnerable to the climatic changes which begin at the end of the Chalcolithic period (Isaar 2003:16–17), partially explaining why these societies disappear at the end of the period.

The issue of rainfall is significant to agriculture because about 250 mm of annual rainfall is needed to practise 'dry farming' and this would eliminate much of the present southern

Levant. However, with wetter conditions during the Chalcolithic period, this would permit agriculture in areas which today are regarded as too arid or too distant from natural habitat zones. This presents two possibilities: either this may be regarded as an expansion of the natural habitat because the annual rainfall would make it possible to cultivate in these regions, or this may be regarded as a change in the growth cycle. With an extension of the annual rainfall, wheat and barley would still have been grown in the winter and spring (i.e. winter growth cf. Sherratt 1980). For the very southern part of the Levant, agricultural societies must have therefore either practised flooding, or simple irrigation farming. However, the numerous springs would have made it possible to grow wheat and barley continuously. Today the best season for farming in Jericho is the winter and farmers plant their seeds from September until April/May (Bøe 2004:96). Although different plants are grown today, this would not include any changes in the growth cycle from the natural habitat zones and agriculture during the Late Neolithic and Chalcolithic and would probably also be based on floodwater, or simple irrigation farming.

Information and studies on faunal material in the 5th and 4th millennia in the Levant have been increasing, but the majority of studies have focused on domestication of animals. Pigs were found at Ghassul which indicates a mesic micro-environment in the vicinity of the site (Goldberg and Rosen 1987:28). At Shiqmim, bones of both domesticated and wild animals were found. The general pattern of the regions seems to indicate a dominance of cattle followed by sheep/goat and pig (cf. Grigson 1998), a natural combination at agricultural sites. The wild animals represented a relatively low number, but included birds, ostrich eggshell, fish, gazelle, a lion tooth and carved ivory (Grigson 1987:220). According to Grigson (1987:220), it was not possible to identify whether the ivory from Shiqmim came from elephant or hippopotamus, but hippopotamus were present in the coastal plains further to the north until the Iron Age. It has been suggested that carved ivories found at Bir es-Safadi represent the head of a hippopotamus (Grigson 1987:230; with reference to Perrot 1959). The presence of lions was only represented by a single tooth, as it is not known when they became extinct in the Levant (Grigson 1987:220) it may have been imported from another area together with the ostrich eggshell. As Grigson (1987:220) mentions, lions were present until at least the 19th century BC in Iraq, but Africa may also be a possible source. Catfish bones have been identified at a site in lower Nahal Besor (Grigson 1987:220; with reference to Roshwalb 1981), while copper hooks and bone gorges have been found at Ghassul (Grigson 1987:220; with reference to Lee 1976), suggesting at least some inland fishing.

Botanical evidence derives mainly from pollen studies of cores from the Hula and Tiberia Lakes made by Horowitz. Goldberg and Rosen (1987:27; with reference to Horowitz 1971, 1979) point out that these studies show several phases of temperature and humidity change, where the period between 7000 and 5000/4500 BP seems to indicate oak and olive forests with a warm and humid climate. By the transition to EB I, there is a peak of oak from cores from Lake Hula (van Zeist and Bottema 1982). Most of the information is based on faunal remains from archaeological contexts, while the information on the early Holocene climatic conditions in Sinai Peninsula is scarce (van Zeist and Bottema 1991:130). However, there are indications of more humid conditions than today, by the evidence of birds, cattle and gazelle at Pre-Pottery Neolithic B sites in southern Sinai, which may be due to a greater frequency of rainstorms coming from the Red Sea (van Zeist and Bottema 1991:131). Little is known about the succeeding millennia, especially with reference to the Sinai Peninsula.

As we see, there is fairly good geomorphological evidence of a relatively sharp climatic change in the southern Levant at the beginning of the 6th millennium BC. According to Bar-Yosef (1992:32), this affected the southern Levant by a series of droughts and prevalence of warm climatic conditions. Initially dry then moister later on, there was a rise in precipitation during the 4th millennium. He argues that, 'The new environmental conditions led, at first, to the desiccation of water resources, to the downcutting of streambeds, and the spread of plant species more resistant to comparatively dry conditions, such as pine and olive' (Bar-Yosef 1992:32). The improved climatic conditions during the 5th millennium may be one of the factors which made pastoral nomadism possible in the region. However, events during the 6th millennium BC are as yet controversial, as there is a temporal gap in most sites between the Pre-Pottery and Pottery Neolithic levels. Moreover, the increase in the number of sites during the 5th and 4th millennia BC in the deserts of Sinai and the Negev (cf. Gophna 1987) corroborates accumulated data from Chalcolithic sites.

The Late Neolithic

This section considers briefly the chronology and periodization of the Late Neolithic in the southern Levant, before more attention is given to the major periods and phases, such as the Wadi Rabha, the Late Neolithic at Ghassul and sites in the desert region. Particular emphasis is put on possible influences and contact, as well as considering what kind of economic adaptation is present.

The Pottery Neolithic, Late Neolithic, Early or Middle Chalcolithic?

With regard to the southern Levant, a number of researchers have assigned different dates and periodization to the archaeological assemblages that appear in the 5th millennium BC. Obviously, this must be seen in connection with the earlier developments of domestication of plants and animals in the preceding Pre-Pottery Neolithic (PPN) A, B and C, which conventionally is dated from 8300 BC to 5500/5200 BC (Levy 1998c:xv). The problem is basically the period between the Pre-Pottery Neolithic and the beginning of the Chalcolithic, or in chronological terms between 5500/5200 and 4600/4500 BC (cf. Fig. 3.2).

Kenyon (1979) divided the Pottery Neolithic (PN) into two phases, A and B, on the basis of the excavations at Tell el-Sultan in Jericho, covering large parts of the 5th millennium BC. Moore (1982) has suggested to name the period between 8500 BC and 6000 BC, Archaic Neolithic (Neolithic stage 1 and 2), basically including PPNA and PPNB. He further names the period from 6000 BC to 3750 BC, Developed Neolithic (Neolithic stage 3 and 4), where the latter (stage 4) would be from 5000 to 3750 BC. Finkelstein (1996) has coined the term Formative Period III for the Pottery Neolithic. However, neither Moore's nor Finkelstein's periodizations and nomenclature have really been accepted or taken into use by other researchers. Both Ben-Tor (1992a) and Bar-Yosef (1992) use the term Pottery Neolithic, for the period between 6000/5800 BC and 5000/4800 BC. From 5000/4800 BC, Bar-Yosef (1992:13) uses the term Early Chalcolithic when referring to sites, such as Wadi Rabah, Teluliot Batashi and Tell Qiri. Just to illustrate the problem even further, Rast (1992:45) in his introductory book, lumps all Neolithic periods together, stretching from 8000 BC to 4500 BC. The major work on chronologies in the Old World even leaves out the dating of the period in general

Moore (1982)	*Ben-Tor (1992c)*	*Rast (1992)*	*Garfinkel (1993) Jordan Valley*	*Joffe and Dessel (1995)*	*Finkelstein (1996)*	*Rosen (1997)*	*Levy (1998a)*	*Garfinkel (1999)*	*Lovell (2001)*	*Levy (2007)*
Archaic Neolithic, stage 1 and 2 8500–6000 BC							PPN (A,B,C) 8300–5500/5200 BC			PPN ca. 10000–5500 BC
Developed Neolithic, stage 3 and 4 6000–3750 BC	PN 6000/5800–5000/4800	Neolithic Period 8000–4500 BC			Formative Period III ?—5000 BC	Later Pottery Neolithic ?—4500 BC	Late Neolithic 5200(?)-4500 BC	PN 6400–5800 BC	Late Neolithic ?—4800	Pottery Neolithic ca. 5500–4500 BC
	Early Chalcolithic 5000/4800–4200/4000 BC	Early Chalcolithic 4500–3800 BC	Early Chalcolithic 5000–4600 BC	Early Chalcolithic ? -4500 BC	Early Chalcolithic 5000–4500 BC	Chalcolithic 4500–3500/3400 BC	Chalcolithic 4500–3500 BC	Early Chalcolithic 5800–5300 BC	Early Chalcolithic 4600–4300 BC	Chalcolithic Period ca. 4500–3600 BC
	Middle-Late Chalcolithic 4200/4000–3200/3000 BC	Late Chalcolithic 3800–3300 BC	Middle Chalcolithic 4600–4000 BC	Developed Chalcolithic (I-III) 4500–3700 BC	Middle Chalcolithic 4500–3800 BC	EB I 3500/3400–2900 BC	EB I A-B 3500–3000 BC	Middle Chalcolithic 5300–4500 BC	Middle Chalcolithic 4300–4000 BC	
	EB I 3200/3000–2950/2900 BC	EB IA-IB 3300–3000 BC	Late Chalcolithic 4000–3200 BC	Terminal Chalcolithic 3700–3500 BC	Late Chalcolithic 3800–3100 BC			Late Chalcolithic 4500–3600 BC	Late Chalcolithic 4000–3800 BC	
								EB I 3600–3100 BC	Terminal Chalcolithic 3800–3500? BC	EB I ca. 3600–

Figure 3.2 Major chronological divisions of periods relevant for the text.

in the outline, only referring to the Yarmukian and Wadi Rabah phases (Stager 1992:22–6). Rollefson (1993) dates the Pottery Neolithic from 5500 to approx. 4500 BC. It should also be noted that some scholars use the term Early Chalcolithic (Garfinkel 1999a; Ben-Tor 1992c) on assemblages between 5500/5200 BC and 4500 BC. Rosen (1997) uses the term Later Pottery Neolithic when referring to assemblages, such as the Qatifian, Wadi Rabah, Ein el Jarba etc., all chronologically preceding the Chalcolithic, beginning at approx. 4500 BC. Some of the most recent work on the issue has been done by Garfinkel (1999a), who has used the term Pottery Neolithic (6400–5800 BC) for sites such as Nizzanim, Jericho IX (PNA) and Sha'ar Hagolan. These sites are basically dated to the 7th and early 6th millennium and will not be discussed further here. Garfinkel (1999a:2–7) has further used the term Early Chalcolithic (5800–5300 BC) for the Wadi Rabah phase, Lodian and Jericho VIII (i.e. Pottery Neolithic B), and Middle Chalcolithic for the period 5300–4500 BC. A recent addition to this wilderness is Lovell's (2001) analysis of the Late Neolithic and Chalcolithic periods based on pottery from the recent excavations from Ghassul on the Jordanian side in the lower Jordan Valley. She suggests that the Late Neolithic ends at 4800 BC (with no clear beginning), preceded by the Early Chalcolithic (4600–4300 BC), the Middle Chalcolithic (4300–4000 BC), the Late Chalcolithic (4000–3800 BC) and the Terminal Chalcolithic (3800–3500? BC). Under any circumstances, the two most recent additions do not seem to solve any of the problems of chronology and nomenclature of the late 6th and 5th millennia BC. This means that within Moore's (1982) framework it is basically his Developed Neolithic stage 4 (5000–3750 BC), which is in focus here, although it is also necessary to examine the relationship to the latter half of the 6th millennium at some of the sites mentioned due to their long occupation. Recently, Blackham (2002) has used the Late Neolithic period between 5500 and 4600 BC, followed by the Chalcolithic between 4600 and 3500 BC. This is the periodization that will be used there, where the latter part (approx. 5200–4600/4500 BC, cf. Levy 1998) of the Late Neolithic is most significant and the rest of the 5th millennia is treated in the next sections, including the Chalcolithic and Early Bronze I.

The reasons for this confusion are multifarious, but it is partly due to the long research history, the lack of ability to incorporate new data except one's own, the fact that the region has for centuries been excavated by foreign expeditions from many different countries and traditions, and lastly the enormous dispersal of the total archaeological assemblage in so many countries making an overview and basic outlines of the chronology and nomenclature extremely difficult. Bar-Yosef (1992:31) also argues that the Pottery Neolithic has fallen between two chairs: one type of researcher is basically interested and trained in the Palaeolithic school, while the other is the researcher primarily interested in the Chalcolithic and Bronze Age. For the time being, Garfinkel's work is probably the most comprehensive, although it has limitations as it only focuses on the pottery traditions. The focus, here, will basically encompass his terms Early and Middle Chalcolithic. The most important factor is probably what sites are taken into consideration when using a specific terminology and chronology. There is also a problem of few radiocarbon dates from the Late Neolithic in general, which in fact may be a reflection of the fragmentary archaeological material from this period.

Dark Ages or Merging Picture?

> The ceramic Neolithic of the Levant is in a sense the 'Dark Age' of the region's prehistory (Rollefson 1993:103).

> In contrast to the abundance of information about this period from northern Mesopotamia, Syria, and Anatolia, our understanding of the Southern Levant is fragmentary (Bar-Yosef 1992:31).

These statements give a fairly recent picture of the Pottery Neolithic in the southern Levant. However, as early as 1949, Albright, in his book, *The Archaeology of Palestine*, more or less skips over the Pottery Neolithic, although the dolmens are connected to this period. The same is the case for Rast's book, *Through the Ages in Palestinian Archaeology*, from 1992. Obviously, these are introductory books, but both reflect a strong emphasis on the historical periods, as well as problems connected to the Pottery Neolithic in general. Gopher (1998:205) also notes that there is a conspicuous paucity of both archaeological material and interpretations of socio-economic developments for the 6th and 5th millennia BC in the southern Levant. Further, he notes that developments and definition of both the Yarmukian and the Wadi Rabah have given a merging picture, although the overall research of the late 6th and 5th millennia has been less intensive and systematic than other periods. However, the picture of the southern Levant is still fragmentary, especially when compared to areas to the north, such as northern Mesopotamia and Anatolia.

The Wadi Rabah Phase

Due to the discovery of a specific cultural assemblage at sites like Wadi Rabah, Tel Aviv, 'Ain el-Jarba, Teluliot Batashi, Lod, Newe Yam and Munhata, Kaplan defined a new cultural phase or group—Wadi Rabah. Garfinkel (1999a:106–8) has recently also added a number of sites based on his pottery studies. At some of these sites, there were stratigraphic sequences that included both the Wadi Rabah and (Ghassulian) Chalcolithic remains. The Wadi Rabah is generally accepted as succeeding to the earlier Neolithic assemblages of Sha'ar Hagolan and the Yarmoukian (Lovell 2001:6).

Geographically the Wadi Rabah culture is found in the Jordan Valley, Western Galilee, the Jezreel Valley and parts of the Central Hills and the Coastal Plain of the Mediterranean zone, although there are a number of variants which might be included, such as the Qatifian (see below) in the northern Negev and part of the Dead Sea (Gopher 1998:215). The sites are usually single period sites and are small, compared to the earlier megasites of PPNB, probably representing small villages or households. However, sites like Munhata and Abu Hamid in the Jordan Valley are both multi-period sites with Wadi Rabah material (Lovell 2001:6, with references). In the Wadi Rabah phase, there seems to be a degree of uniformity over large geographic areas.

Garfinkel (1999a:109, 150, table 15, 67, 68 and 69) has also pointed out typological similarities and sees a large degree of uniformity in the pottery between the Wadi Rabah, Tell Halaf, Shams ed-Din Tannira and Tell Turlu in Syria, a point which has been stressed by several researchers (Wright 1951; Kaplan 1960; Kirkbride 1971). Garfinkel (1999a:150) notes typological similarities in vessel shapes, but not in decorations, like painting, which are totally absent on Wadi Rabah vessels. This might indicate that the Wadi Rabah was the western variant of the Halafian cultures, but there may also be other connections and similarities, which we will see towards the end of the next chapter. However, what this means, in terms of interaction or diffusion, is not considered and the cultural implications are therefore vague. One important site in this connection is Ard Tlaili in the Beqqa valley, dated between 4900–

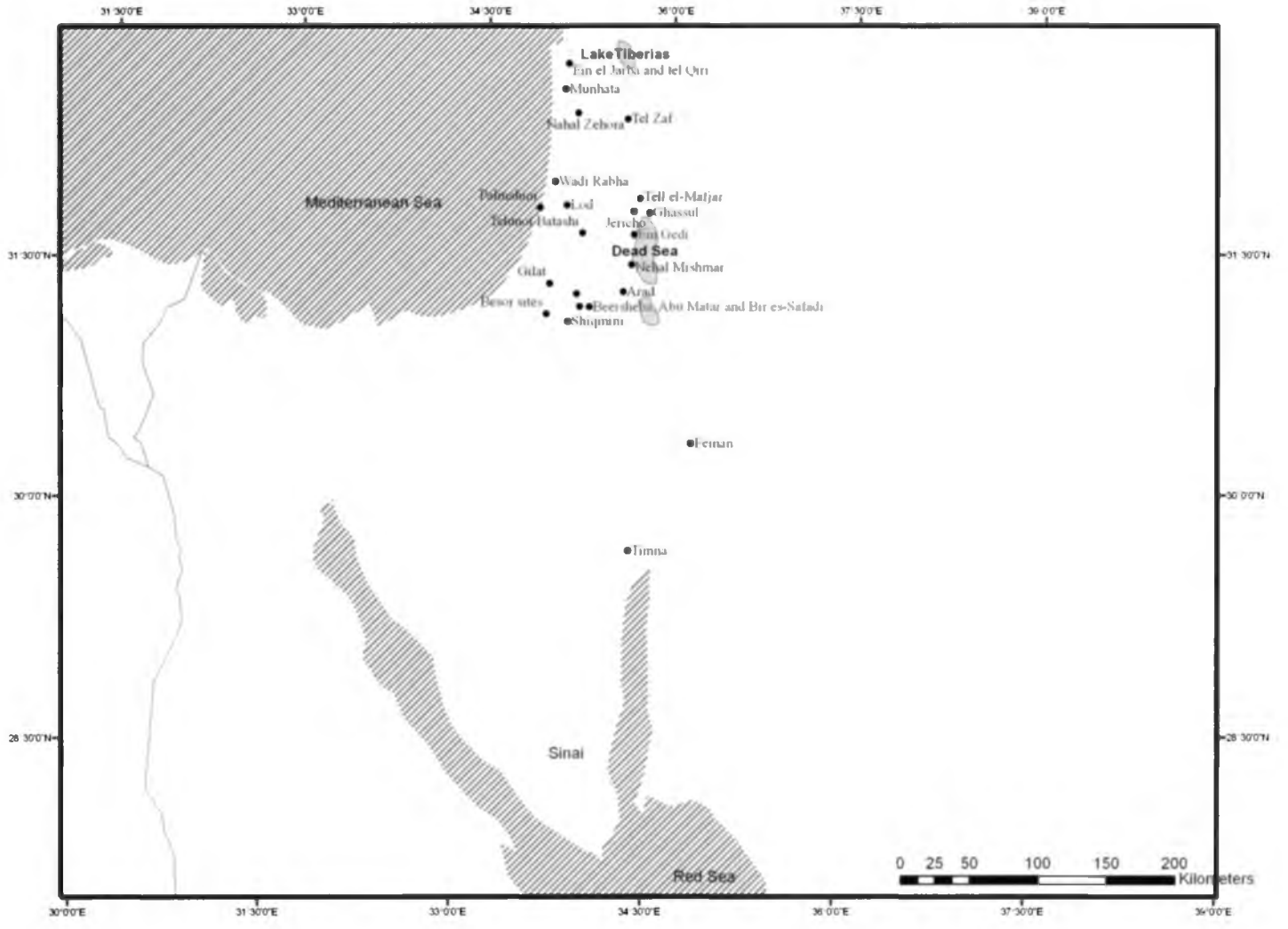


Figure 3.3 Major Late Neolithic sites as mentioned in the text.

4700 BC (Gopher 1998:211) and is frequently referred to as a link between Mesopotamia and the southern Levant.

The architectural features of the Wadi Rabah consist of rectangular houses, both single and multi-room, with foundations of stone and superstructure of possibly mud-brick and/or adobe (Gopher 1998:211). Other features may include more superficial huts or shelters, of 3-4 m diameters and depths of 1 m (Bar-Yosef 1992:34). Some of these structures are relatively large and show evidence of internal subdivision. Small circular silos sunk into the ground are often in the vicinity of the house structures. These have likely been used as silos or for clay quarrying (Gopher 1998:211). Gopher (1998:211) argues that, 'The economy of the Wadi Rabah population is based on livestock exploitation, including goat, sheep, cattle and pigs, with emphasis on ovicaprines. Hunting was rare and this is reflected in the paucity or complete absence of arrowheads from the lithic assemblages'. This may be supported by spindle whorls, suggesting spinning and weaving. Gopher claims that botanical material from Nahal Zehora II probably contains cereals and pulses. He has also suggested that the settlement pattern may reflect some kind of specialization and centre-periphery relations in the Wadi Rabah of the Jezreel Valley (Gopher 1998:215). Lithic industry, according to Gopher (1998:211–12), is dominated by flake technology, relatively few arrowheads, rectangular truncated and backed sickle blades, bifacial knives, tabular scrapers, as well as grinding stones or slabs. The lithic material bears indications of on-site production due to a high frequency of various forms of waste and core trimming elements (Gopher and Gophna 1993:328).

The Late Neolithic: Pottery, Burials and Obsidian

According to Gopher (1998:212), new forms and techniques appear in the pottery of the Late Neolithic, as well as a number of new sites (see Fig. 3.3). In addition, zoomorphic figures are known from a number of sites, such as Nahal Betzet I, Tel Tsaf and Nahal Zehora II (cf. Gophna and Sadeh 1989). Although the pottery of the Wadi Rabah has been described as relatively distinct, it has also clear similarities to pottery types in Lebanon and north Syria (Bar-Yosef 1992:39). Gopher (1998:215–18) argues that the most important invention during the Pottery Neolithic is the appearance of the pottery, which may have also had symbolic, social and economic consequences. The appearance of pottery correlates relatively well with the decreasing frequency of arrowheads during the Pottery Neolithic period—almost disappearing in the Wadi Rabah culture and the succeeding Chalcolithic period.

These changes may also be seen in spinning, weaving and basketry, although there is no direct evidence of textiles or looms. According to Gopher (1998:218), the Pottery Neolithic represents no major break with the preceding periods, but rather it is a readjustment and consolidation meeting new economic needs. Although he suggests some olive-pressing installations already in the latter half of the 6th millennium, the actual evidence for this is rather scarce. There can be no doubt that there is evidence of domesticated animals, like pigs, goat/sheep and cattle. However, one must question whether partial pastoralism was pursued as Gopher (1998:218) suggests, in addition to the exploitation of secondary products. Although domesticated animals may possibly have been herded and exploited for their secondary products, there is no further evidence in the archaeological material really indicating this, except for the possible spinning and weaving activities and a possible proto-type of a churn from Nahal Zehora I. According to Gopher and Gophna (1993:334), clay animal figurines are known from Munhata, Nahal Zehora II and Wadi Rabah and related assemblages, such as

Tel el-Mafjar (Taha *et al.* 2004; Anfinset 2005, 2006), Tel Tsaf and Nahal Betzet I. The faunal assemblages from these sites show a dominance of sheep and goat, followed by cattle and pig, with rare elements of game and fish (Gopher and Gophna 1993:334).

Regarding exchange of commodities, Gopher (1998:218) suggests two different systems operating: one on a small-scale, day-to-day basis, and another on a long-range system. The latter is reflected by the small quantities of obsidian which have a suggested source in Anatolia. In addition, different minerals from various regions were brought to sites all over the southern Levant. A striking phenomenon is that there are no human figurines known from the Late Neolithic period (i.e. the so-called Lodian and Wadi Rabah cultures, as defined by Gopher 1998). The burial customs in the Lodian seem to use traits from earlier periods, such as the flexed position of the bodies with the skulls intact and no grave goods. This also seems to be the case at the Wadi Rabah sites, with burials in the floor of at least one headless child and the use of jars for the burial of babies and foetuses. All these seem to be part of earlier traditions in the Levant (cf. Kujit 1996) and the tradition of children buried in jars within the settlement is also found at Byblos. According to Gopher (1998:220), the period represents an established system of agricultural villages, based on small territories, with an economic basis in animal husbandry and agriculture and relatively little hunting.

Bar-Yosef (1992:31) argues that there is a marked change, both in terms of location and internal organization, in the settlement pattern during the Pottery Neolithic and most of the remains consist of pits of various types, including house- and storage pits. Both Garfinkel (1999a) and Bar-Yosef (1992:32) argue that there are broad similarities in pottery decoration, possibly as a result of contact or informational flow within the region or between regions. Gopher (1998:207) suggests that the local population of the southern Levant went through cultural changes, establishing a new rural system in the southern Levant, but during the 5th millennium BC, there is evidence of northern influence. The climatic changes that took place in the 6th millennium onwards, mentioned in the previous section, probably led to a relocation of sites on wadi terraces, which were later covered by sand and pebbles. Two examples of this are Ghassul and Tell el-Mafjar, both found in the Lower Jordan Valley, where down-cutting of the wadi terraces appear. Garfinkel (1999a) has recently placed Tell Tsaf and Tell el-Mafjar together with 21 other sites, which, according to him, belong to the Beth Shean (northern) pottery-ware tradition and are dated to his Middle Chalcolithic.

Ghassul Late Neolithic

During Hennessy's (1969) excavation at Ghassul, it became clear that the site had an almost unbroken sequence of many major building phases, starting in the Late Neolithic and stretching throughout the 5th millennium BC. During the most recent excavations (1994–97) at Ghassul, the lower parts of the site represented a Late Neolithic phase, including typological features with regards to the pottery (Lovell 2001:47, 49). This is further confirmed by more recent radiocarbon dates that indicate the Neolithic phase at Ghassul (Weinstein 1984:333–4; Levy 1993a:508; Lovell 2001:appendix C). On the basis of the ceramic study from Ghassul, Lovell (2001:51) suggests that the site was relatively isolated in the Jordan Valley, though with some similarities to sites like Sahab, Abu Snesleh, Abu Hamid and sites in the Negev. There is no evidence of copper mining or metallurgy in this early phase. The architecture from these early phases seems to indicate pit dwellings, in addition to circular houses with sunken floors, surrounded by low *pisée* walls, and post-holes to support a roof (Levy 1993a:508). However,

there is not much information on the material culture from the Late Neolithic phases, except the pottery which has recently been analysed by Lovell (2001), though the problem is that the pottery has a long sequence of local development, but few typological similarities with other Late Neolithic pottery assemblages (Blackham 2002:19). In any case the location of Ghassul, as well as the local environment, must have been favourable because it developed into one of the largest sites in the southern Levant during the late 5th and 4th millennia BC. Ghassul will be discussed more comprehensively in the next section with reference to the Chalcolithic period of the southern Levant.

Qatifian and the Desert

On the basis of pottery finds, Garfinkel (1999a:153) has divided the Late Neolithic (his Middle Chalcolithic) into two main regions: the northern Beth Shean ware mentioned earlier, and a southern Qatifian ware, which is found mainly in northern and western Negev, in the Feinan region of Jordan, in one site on the Coastal Plain and in another in the Judean Desert. According to Garfinkel (1999a:189–90), this assemblage consists of shards from sites, such as Qatif, Site P14, Site D11, Site A, Site B, Site M, Tell Wadi Feinan, Herzliya and Teluliyot Batash. From the latter site, an infant jar burial and a silo lined with stone slabs were found (Garfinkel 1999a:190). A similar type of jar burial, with an infant in a flexed position, was also found by Epstein (1984) in the floor of a living space at Qatif (Y-3). Garfinkel (1999a:190) notes further that the pottery is handmade, with no special emphasis on the finish, the pithoi have the handles inserted through the walls and petrographic studies reveal that the local area of the site was used to make the artefacts, using straw mats as the work surface.

In the late 1920s and early 1930s, the sites in the Nahal Besor area were excavated and surveyed by MacDonald (1932), later followed by Perrot (1962), Alon (1977) and others. Although these were first believed to be mainly Chalcolithic sites, it has become clear from more recent studies that several belong to the Late Neolithic Period (Kaplan 1958; Moore 1973; Roshwalb 1987). Epstein (1984) has suggested that the Qatif site was occupied by farmers harvesting cereals and raising sheep, goat, pig and cattle. Gilead (1990:48) has pointed out it is rather doubtful that they were semi-nomadic, due to the high proportion of pig bones. At this site, the most common flint tool is the sickle blade, while arrowheads were present but rare (Gilead 1990:48, and figure 4). At Site P14 and Site D 11, similar types of pottery were found in a sounding which also included ashy pits, fan scrapers and sickle blades (Gilead 1990:54). Gilead (1990) addresses the many similarities between these sites in the northern Negev and Sinai, pointing out how they also differ from other Late Neolithic sites in the southern Levant. This may represent a continuation, rather than a break in the local transition from the Late Neolithic to the Chalcolithic in the northern Negev and Sinai, based on both typological and economic (mixed farming) continuity (Gilead 1990:62).

Sites are also found in the desert zones, which Bar-Yosef (1992:33) suggests either belong to a continued hunter-gatherer population on the margins of the developing civilizations, or to pastoral communities. However, there are a number of features that are also known in earlier periods of the region. Basically, they are interpreted as seasonal camps, with little or no pottery, possibly reflecting a pastoral economy accompanied by hunting, which is reflected by the presence of arrowheads (Bar-Yosef 1992:39).

As we see, during the Late Neolithic, there are a number of indications that point towards different adaptations in different regions of the southern Levant. However, the legacy of

the PPN seems to be modified and developed throughout the millennia, with increasing emphasis on animal husbandry. Further, the interregional contacts are still present, as in PPN, particularly through obsidian, but this also seems to be partially reflected in the pottery and influences from northern Mesopotamia.

The Chalcolithic Period

Since Albright's identification of the Chalcolithic period in the southern Levant, in the 1930s, the nature of this period has remained generally unclear and problematic. The chronology and the terminology of the Chalcolithic are conventionally dated between 4500 BC and 3500–3300 BC (Stern *et al.* 1993; Levy 1998a; and others), but there is no consensus (cf. Garfinkel 1999a). This will be discussed further below. The scope of this section is to explore how archaeologists have been and are using the term Chalcolithic. The discoveries of the first village societies in the Lower Jordan Valley, the Beersheba region and the discovery of the enigmatic Cave of the Treasure at Nahal Mishmar (Wadi Mahras) are all dated to this period (see Fig. 3.4). Firstly, however, it is necessary to examine the periodization and dating, before the nature of the sites, specialization and contacts are considered. Afterwards, focus is put on the changes that seem to appear when the Chalcolithic societies disappear.

Chalcolithic, Late Chalcolithic or Terminal Chalcolithic—a Real Chalcolithic?

> Great confusion in fact prevails in the application of the terms 'Neolithic' and 'Chalcolithic' by Palestinian archaeologists (de Vaux 1966:520).

Although de Vaux wrote this 40 years ago, it still has validity and the confusion is probably even greater today as new terms and phases have been singled out. The history of the term in the southern Levant is fairly recent, compared to other regions, such as south-eastern Europe. It was during the debate on the newly discovered mounds of Tuleilat Ghassul (Mallon *et al.* 1934; Koeppel 1940) and their dating, that the term first came into use in the 1930s. Levy (1986:84) has pointed out that, 'William F. Albright, then the director of the American School of Oriental Research in Jerusalem, was responsible for initiating the use of the term *Chalcolithic* as an archaeological-ceramic equivalent for the newly discovered Ghassulian phenomenon' (Albright 1931, 1932). When Albright introduced the term, 'Chalcolithic', in the late 1920s and early 1930s, it had already existed in Europe for more than 50 years. From a research historical point of view, von Pulszki first defined the Chalcolithic period in 1876, at the International Congress of Archaeology, Budapest, Hungary (Forbes 1964:2). This was a refinement of the three-age system, which Thomson had established in 1819 (Trigger 1989:78), where prehistory was divided into three periods—stone, bronze and iron—based on evolutionary ideas and the progress of mankind. Von Pulszki argued that there was a need for a fourth period, a Chalcolithic period, which was a transitional period from stone to metal between the Stone and the Bronze Age. This Chalcolithic, or copper-stone age, was based on the extremely rich archaeological cultures of southeastern Europe, and the elaborate use of copper and gold. These precious metals are two central materials that may signify a Chalcolithic period from a European perspective.

Referencing the aforementioned issue of chronology and nomenclature of the 5th millennium, many of the same problems exist in the Chalcolithic period (cf. Alon and Levy 1989:168;

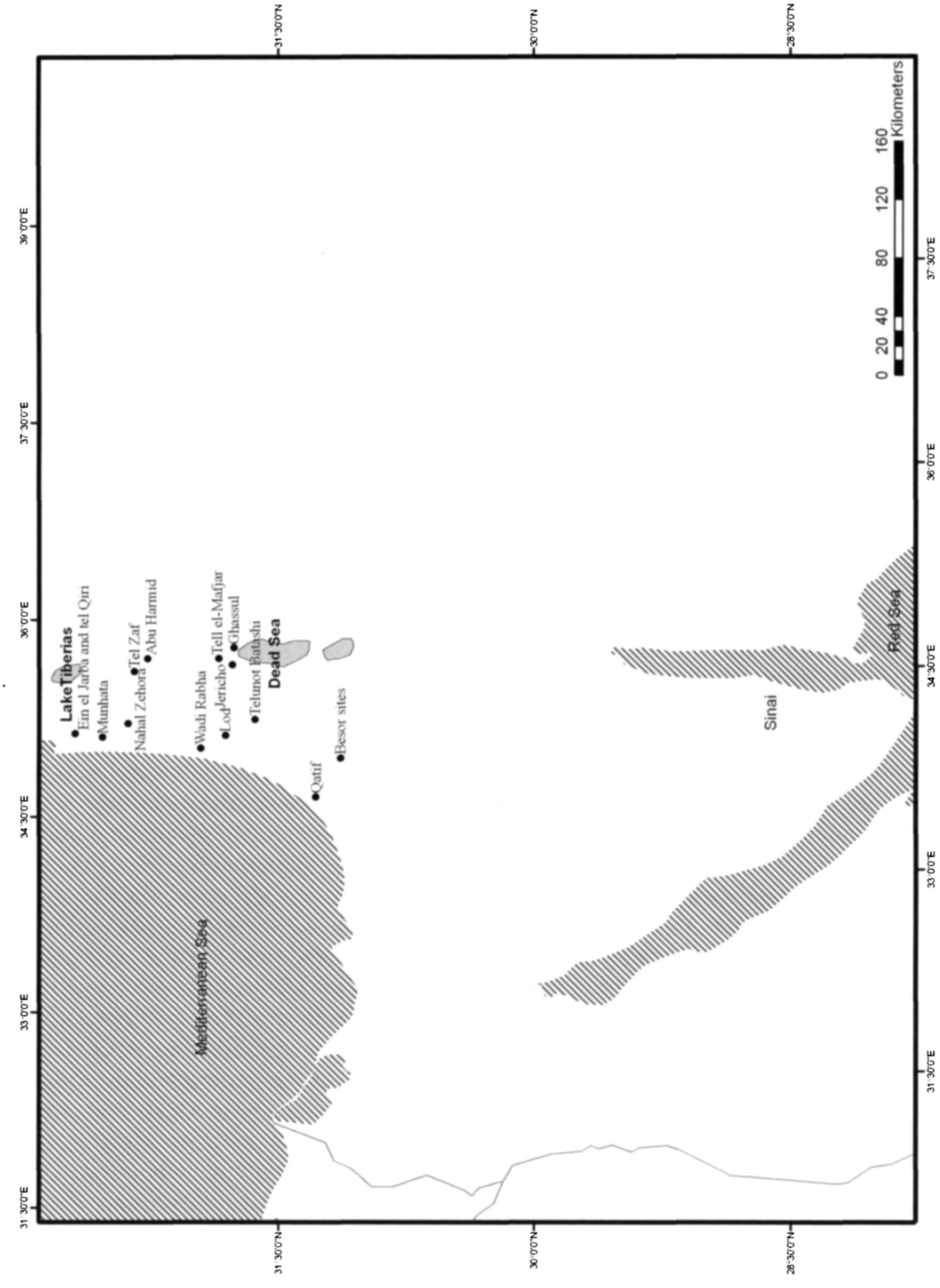


Figure 3.4 Major Chalcolithic sites mentioned in the text.

Joffe and Dessel 1995; Finkelstein 1996; Garfinkel 1999a:table 1). At the beginning of the 4th millennium, there are no clear-cut divisions, as the Chalcolithic period continues at least into the middle half of the 4th millennium, and was succeeded by the Early Bronze I (EB I). Garfinkel (1999a:table 3) uses the term, 'Late Chalcolithic', for the majority of this period, which has a duration of about 900 calibrated years, lasting from 4500–3600 BC and is compromised mainly of sites, such as those at Ghassul, the Golan and Beersheba. For the Jordan Valley, Garfinkel (1993) has also divided the Chalcolithic into three different phases—the Early Chalcolithic 5000–4600 BC, the Middle Chalcolithic 4600–4000 BC and the Late Chalcolithic 4000–3200 BC—which does not leave much space and time for the EB I. Garfinkel (1999a) has more recently refined this picture and suggested slightly different dates (the Early Chalcolithic 5800–5300, the Middle Chalcolithic 5300–4500, and the Late Chalcolithic 4500–3600). Just to complicate the picture even more, Finkelstein (1996) uses a similar division, though with different dates (the Early Chalcolithic 5000–4500 BC, the Middle Chalcolithic 4500–3800 BC and the Late Chalcolithic 3800–3100 BC). Joffe and Dessel (1995) have also chosen a tripartition (the Early Chalcolithic ?–4500, the Developed Chalcolithic 4500–3700 (I: 4500/4400–4100, II: 4100–3900, III: 3900–3700) and the Terminal Chalcolithic 3700–3500), with an internal division of the Developed Chalcolithic. More conventional dates have been between 4500 and 3500/3400/3200 BC and this is generally the most accepted (e.g. Gilead 1988; Rosen 1997; Levy 1998c). Both Levy's and Rosen's studies are basically from the southernmost area of the southern Levant, especially the region bordering the Negev and the Negev desert itself. Their work is extremely important, but there are some limitations connected to the rather small area from which the material is collected and synthesis which is made on a much larger regional scale. This is not only due to regional activities, but also due to the results of political decisions and the general political situation in the region. However, the work done by Levy and others, who have worked on a larger scale, limited mainly to the southernmost part, is not to be underestimated. This work is important to establish a larger chronology and understanding of the processes that take place in the region during the Chalcolithic period. More recently there has been a significant revision of the Chalcolithic and EB I transition which will be dealt with below when considering the EB I.

The Origin of the Chalcolithic and Increased Contacts

As previously mentioned, several researchers have pointed out that there are local Neolithic traits in the Chalcolithic period. However, over the last decades, there have been a number of different opinions on the origin of Chalcolithic societies. Perrot (1955:185) argued that the Chalcolithic societies of the Beersheba must have had a foreign origin as they appear suddenly, possibly from Transjordan. Kenyon (1979:63) and de Vaux (1966:529–30) both focus on the intrusive argument from the north or northeast and de Vaux suggested even Armenoid or Anatolian races. Hennessy (1967) also regarded the Chalcolithic as being introduced to Palestine in a great movement, possibly connected to the developments further to the north and in Mesopotamia. Kaplan (1969:30), on the other hand, took a medium position, where he sees the material culture as a direct continuation from Wadi Rabah and Jericho VIII with people coming from southeast Anatolia as shepherd or herdsmen. Ben-Tor (1992b:84), as well, views the Ghassulian-Beersheba Chalcolithic as intrusive to the region. Moore (1973:64–8) saw the development of the Chalcolithic as a local evolution based on a development and continuity in pottery and flint from the Neolithic to the Chalcolithic period, similarly Gilead

(1990:62) suggests a local evolution with possibly minor intrusive foreign elements. Gopher and Gophna (1993) also see the Chalcolithic as a development of the previous Neolithic periods. This issue has been connected to the interpretation of the introduction and spread of metallurgy in the southern Levant. There is a number of similarities between the previously described Wadi Rabha and the Chalcolithic sites mentioned here. This is especially seen in infant jar burials in floors and in mud-brick, rectilinear houses with stone foundations.

Bourke (2002:5) has recently pointed out that Ghassul and other sites in the Jordan Valley that are dated to the Chalcolithic are at least partly contemporary with the Merimda/el-Omari in the Nile Delta, as well as the Badarian and Naqada I in the Nile Valley. Lovell has, on the basis of pottery from Ghassul, argued that, 'Evidence from Ghassul suggests that whilst the Chalcolithic period saw rich and varied cultures across the landscape, unsurprisingly, the level of development and contact between the villages was inconsistent at the best' (Lovell 2001:51). In fact Lovell (2001:51) suggests that the main developments of Ghassul are indigenous and organic and argues further, that the 'Teleilat Ghassul possesses aspects of Late Chalcolithic culture which indicate general shared traditions with the Negev, and even a shared systems of beliefs'. This is an issue that may also be seen in connection with the material in general. As for the previous Late Neolithic and here, the Chalcolithic, it is interesting that there is rarely any consideration of cultural contact with societies to the south, which are in fact also much closer geographically. However, Ben-Tor (1992b:93) has argued that there is increased evidence of Egyptian relations with the southern Levant, already in the Chalcolithic period. When discussing interregional interaction and cultural contact in prehistoric, as well as historic periods, it may seem that interpretations fall easily into current political and religious trends.

Agriculture and Pastoralism

Chalcolithic sites are documented all over the region, including the Coastal Plains, Golan Heights, Jordan Valley, Judean Desert, Central Hills, Negev and Sinai. Scham (1999:58-59) has identified four Chalcolithic settlement types:

1. Cave sites—permanent or semi-permanent, possibly used by pastoralists.
2. Temporary sites—seasonal, open-air sites without structures, indicating a long habitation.
3. Small farming villages—like several of the Chalcolithic sites in the Negev.
4. Large farming villages—for example, sites like Shiqmim in the Negev and Ghassul in the Jordan Valley.

A recent survey has indicated numerous habitations in the caves of the Central Hills, during the Chalcolithic (cf. Wexler 2002), but these have often been disturbed by later use. Fragmentary evidence may also indicate short occupations, possibly connected with pastoral activities, either by transhumance or by specialized pastoralism.

When considering the material culture of the Chalcolithic period, a number of similarities are found, but there are also features that are specific for certain areas (e.g. basalt in Golan; metallurgy in the Beersheba region). The profound changes manifested during the Chalcolithic period must be seen in the context of important and widespread changes occurring in agricultural and transportation technology, as well as in animal husbandry, which is also known as the 'Secondary Products Revolution' (cf. Sherratt 1981; Levy 1983). The consequence was

substantial change to social organization, gender roles and modes of subsistence. In the southern Levant, this is evident in the richly symbolic features connected to clay animals and figurines, pottery (such as churns, cornets and cups), ivory figurines, wall paintings, the extremely rich metal hoard from Nahal Mishmar, ceramic *pithio* for storage and anthropomorphic statuette heads in basalt, etc. There is also evidence of fruit growing and advanced water management. Olive cultivation is documented, both at Ghassul and in Nahal Mishmar (Zohary and Hopf 2000:149), where the former may indicate cultivation under irrigation (Zohary and Spiegel-Roy 1975:320). Recent finds in Golan (Epstein 1993) and in the central coastal plain (Liphschitz *et al.* 1991) further support this idea. Evidence of cultivated dates is found at Ghassul, with finds of carbonized seeds and kernels from the Chalcolithic layer in Nahal Mishmar (Zohary and Spiegel-Roy 1975:323; Zohary and Hopf 2000:165–6). In addition, carbonized pips of figs have been found at Jericho, dating to the Neolithic, Chalcolithic and Bronze Age layers (Zohary and Spiegel-Roy 1975:324; Zohary and Hopf 2000:164). Olive has recently been documented by pottery analysis at the Chalcolithic temple at Gilat, and points towards a long tradition of using olive oil in the region and a special symbolic significance connected to olive oil (Levy 2006c; Burton 2007). It is particularly significant when considering the temple context of Gilat, and that the recent analysis of the so-called 'Torpedo' jars from Shiqmim has revealed a content of fatty acid profiles that resemble degraded plant or olive oil (Burton and Levy 2006; Burton 2007:225). Furthermore, evidence of diversion walls along the wadi channel in Beersheba, dating to the Chalcolithic period have been found, as well as evidence of wheat and barley grown under irrigated conditions at Shiqmim (Levy 1986:103). Finds at Jawa in the Black Desert in eastern Jordan, also provide evidence of advanced water management systems, including storage facilities, canals, dams, deflection walls and conduits for irrigation (Helms 1977). This suggests cultivation with specialized adaptation to the environment, together with exploitation of all available resources. It is precisely within this context of innovation and changes that metal and metallurgy is introduced and developed. The first metal objects are found in the southern Levant in the latter half of the 5th millennium. The spread of metallurgy was probably stimulated by the urbanization process in Mesopotamia, but did not spread to the southern Levant until the latter half of the 4th millennium. At Ghassul, there is no evidence of casting or producing copper artefacts and the few copper artefacts found are generally interpreted as being 'imported'. This supports Golden's (1998) notion that the number of copper artefacts is extremely limited in the first phases of the Chalcolithic, with only artefacts from Meser and Ghassul and no evidence for the production of these artefacts. Golden (1998) focuses on the inception of metallurgy in Chalcolithic societies, using archaeometallurgical analysis to understand the production, organization and use of metal, which in turn would also give insight to socioeconomic organization. To Golden (1998:150), copper is the hallmark of the Chalcolithic material culture, in spite of the fact that the number of artefacts is relatively small in the vast majority of sites (with the exception of the Nahal Mishmar hoard) and considering a timespan of at least 1000 years where the first part does not have any copper artefacts at all. Tell Tsaf and Tell el-Mafjar in the Jordan Valley are also dated to the Late Neolithic-Chalcolithic and its similarities are exemplified in painted pottery, which shares similarities to Wadi Rabah, as well as Ghassul and Gilat.

Scham (1999) has recently used a statistical and quantitative approach on issues, such as economic, social and political organization at Ghassul in the Jordan Valley. This illustrates the impact of pastoral production at several levels. Bone material from Ghassul indicates

sheep, goat, cattle, equines, pig, and more rarely gazelle and other wild species (Scham 1999:108–109, table 3.1). This is further supported by the incised animal motives on pottery shards, possibly indicating sheep and goat (Scham 1999:264), as well as the well-known wall paintings, also indicating animals (Cameron 1981). In addition, at Ghassul, as also evidenced at several other sites, such as Nahal Mishmar, Tell el-Mafjar and Tell Tsaf, there are animal figurines interpreted as sheep and goat. The figurines of animals from Ghassul derive from the last phases of the site, and were also found by Mallon (*et al.* 1934). Hennessy (1969:21, see also plate) describes the figurines as, 'Three crude figures found together in a large vat of olive seeds' and also with two other figures. Scham (1999:269) suggests, therefore, that Ghassul developed an ideology in which animals played a vital role, especially those connected to a pastoral economy. Spindle whorls are especially common in the upper phases (A-E) (Hennessy 1969:21), which should also suggest the use of wool or flax. An intensive survey of the surroundings of Ghassul demonstrated a settlement hierarchy with numerous sites, up to a distance of 3 km away, showing a similar material culture. Although the sites were small with no evidence of specialization beyond flint and pottery, at least 20 sedentary and pastoral sites were associated with Ghassul within a 3 km radius (Scham 1999:272ff). Therefore, she suggests that the Central Place Theory may be applicable, due to the evidence of sanctuary, iconography and the material culture found here. Scham sees this as the 'internal expansion' of Ghassul itself and not the result of pastoral nomads operating inside and on the periphery of Ghassul. The small temporal sites and pastoral camps are interpreted as pastoralists from Ghassul, using the local environment and not moving far beyond this, thereby forming a kind of village-based pastoralism (Scham 1999:277). According to Scham (1999:285), the pastoralists encouraged the production of new products, which led to craft specialization and increased production of goods, such as pottery. However, it is not clear how this is related to the use of secondary products. What is important is that there seems to be a growing focus on the fertility of flocks during the Chalcolithic, where animal figurines of clay feature prominently.

Another site representing a mixed economy of animal husbandry, farming and cultic activity, is Gilat (Alon 1976, 1977; Alon and Levy 1989). A number of churns, cups, cornets and fan-scrapers have been found here, in addition to the so-called 'violin-shaped' figurines, a ram with cornets on its back and the so-called 'Gilat lady'. Found at this site, are also architectural features suggesting monumental or public buildings, as well as a number of standing stones. There are stone-lined silos for storage of grain and copper ore or 'greenstones' which, according to Golden (1998:47) are an indication that Gilat precedes the local advent of metallurgy due to the lack of metal. Golden (1998:44), following Levy's interpretation of the site, suggests that Gilat was a centre within a larger region, importing goods from elsewhere. Similarly, both Ein Gedi and Ghassul have been interpreted as sanctuaries, temples or cultic centres and several have argued for later similarities with the Bronze Age temples. Seaton (2000, 2006) has recently made a detailed analysis of the 'Sanctuary area' (Area A) at Ghassul relating this to questions on the origin of urbanism and complexity. She argues (2000) that the evidence from Ghassul points in the direction of a specialization on the cultic level, and fulfils in this connection the overall picture of increase social complexity. One of her arguments is that the emergence of the Ghassul temple is based on coordinating increased social organization. This has earlier been developed by Levy (1993b) at Shiqmim, who argued that economic activities were closely connected to rituals and maintenance of a social hierarchy, tied to risk management and the

support of full-time specialists (Levy 1993b:77). Of significance here is that there is also a growing focus on expressing cult and rituals throughout the region, which clearly must be seen in context with increased social complexity and great connectivity across regions.

At Shiqmim (Levy 1987), simple irrigation farming has been documented, in addition to herding strategies, forming the basic economic adaptation. Bone material suggests traction of animals likely used for ploughing. As the animals seem to have been mature, this also indicates utilizing the animals for milk and wool products. The site represents a relatively large permanent settlement. This picture is now supported by analysis of the Chalcolithic churns which contained fatty acids residues that according to Burton (2007:225) resembled degraded animal fats, lacking both wax and aromatic biomolecules indicative of plants. Burton (2007:234) suggests that the churns may possibly have been used for thickened yoghurt rather than churned butter, as the latter would be difficult to retrieve in a narrow neck. This at least indicates that milk and wool production were already possible in the Chalcolithic period. Though the scale may be questioned, much of the well-known Middle Eastern economy was clearly in place. Additionally, there is evidence of copper ore, slag, crucibles and furnaces, all of which seem to be connected to household activities. Copper artefacts, such as chisels, awls, axes, adzes and complex castings of mace-heads and standards have also been discovered at the site. These issues will be returned to in Chapter 6.

It is also suggested that due to population growth and increased exploitation of resources, specialized pastoralism emerged during the Chalcolithic period in the southern Levant (Levy 1983, 1992). This may also indicate that products, such as metal, fruits and secondary products could have been employed in a system of exchange between mobile and sedentary groups (cf. Sherratt 1999:15–16). This idea will be pursued later, after considering pastoral nomadic groups in Chapter 5 and reviewing the artefactual evidence of metals and metallurgy in Chapter 6. During the Neolithic, food production was centred on the family as an economic unit, whereas during the Chalcolithic period there seem to be several changes. New and larger settlements than the previous Neolithic sites appear in the Levant, in addition to changes in burial practices where cemeteries are used for the first time with the possible use of cave tombs (e.g. Garfinkel 1994; Golden 1998). Golden (1998:2) suggests that a new set of ritual beliefs may be connected to the appearance of a unique symbolic system and an artistic tradition seen in the major changes in the material culture, leading to economic development.

The Case of Nahal Mishmar

A brief consideration of the hoard of Nahal Mishmar will be undertaken separately, mainly because of its scale and dating. As will be seen in later chapters, the sheer size of the Nahal Mishmar hoard is clearly outstanding and in no way representative of the general metal finds of the Chalcolithic in the southern Levant. This, coupled with its dating, makes the case both enigmatic and difficult to treat in a broader cultural context. However, it is noteworthy that several of the artefacts of Nahal Mishmar do have parallels with other more or less contemporary sites, although this find is unique.

The caves

The location, found in a cave in the steep hills of the Judean Desert, facing the Dead Sea and more or less inaccessible without climbing and using a rope, makes it even more spectacular (Bar-Adon 1980). Here, five caves were located, the most important and stunning being 'The

Cave of the Treasure' (Cave 1) which had a shallow Bar-Kokhba Revolt (AD 132–135) stratum in addition to the Chalcolithic remains. Cave 1 consisted of five burials: two children, one woman and two men. The metal consisted of more than 400 objects and will be described in Chapter 6, needing no further comment here. There were also a number of other artefacts found in the cave. Among the miscellaneous finds were beads of agate and faience, in addition to shells and lapis lazuli beads. These was found in the Intermediate level and their context is uncertain (Bar-Adon 1980:150). The Intermediate level is dated to the Roman period, but lapis lazuli is not known to be in use during this period. Additionally, there were churn fragments, clay animal figurines, fragments of querns and ivory from a hippo tusk and a box made of elephant ivory. Due to the arid climate, the conditions for preservation of organic material were good and finds include uncarbonized food remains, straw mats and trays, a straw sieve, textiles, leather objects, wooden tools and a loom with accessories (Bar-Adon 1980).

Cave 2, situated in the same cliff face as Cave 1, was much smaller. Although disturbed by recent activities, six skeletons were found untouched. This cave consisted of six burials: four children, one woman and one man. People were clearly buried here in the Chalcolithic period and excavators interpreted the cave as the burial zone of the inhabitants of Cave 1 (Bar-Adon 1980:6). In Cave 3, scattered bones of humans and fragments of a pottery churn were found. Under heaps of rubble, 10 burials were found: five children and five men. Some of these were in a contracted position and several had jars and bowls next to them, indicating the Chalcolithic period (Bar-Adon 1980:8). Cave 4 had a few shards from the Iron Age, and some Chalcolithic and Roman shards. In addition, a few iron objects were discovered, though of uncertain date. No burials were found in this cave (Bar-Adon 1980:9). Cave 5 was the largest, but as the entrance and passage had been blocked in ancient times, it needs more examination (Bar-Adon 1980:11). Along with these five caves, an oval enclosure, 37 m long and 27 m wide, was discovered on the cliff-top above Cave 1 and 2. A trial excavation yielded Chalcolithic shards only (Bar-Adon 1980:12). The enclosure had several smaller rooms located inside and out. The excavator rules out the possibility of a livestock enclosure, suggesting rather an open-air cult place (Bar-Adon1980:13).

Dating and origin

At this time, there are two methods of dating that have been considered. One is the comparative aspect and the other is radiocarbon dating. Technical aspects of the copper artefacts themselves may also contribute to the dating of the cave.

The initial dating done by the excavators was the end of the Chalcolithic period and the beginning of the Early Bronze Age periods. This was based on the similarities of both metal finds and the pottery objects to those found at other sites, although most of the artefacts were previously unknown (Bar-Adon 1980:7). Several mace-heads, standards and crowns have also been found at other sites, as mentioned above. Further, there are a number of similarities in the pottery, particularly the churn; the jars and bowls also bear similarities to both Ghassul and Beersheba. These, in addition to the painted decoration and the thumb-impressions of the pottery, have clear similarities to other Chalcolithic sites; however, the similarities have given little understanding of the introduction, production and use of metal in Chalcolithic societies of the southern Levant.

The radiocarbon dates are all fairly uniform (cf. Bar-Adon 1980:199), giving a timespan of about 600 years, although they were controversial when first published. In a later article,

Moorey (1988b:173) argues that the calibrated dates cluster in the second quarter of the 4th millennium and that the objects are not likely to date after 3500 BC, though they might be considerably older. On the other hand, Muhly (1976:88), on the basis of the technical process of the Nahal Mishmar copper artefacts, has suggested dating to the latter half of the 4th millennium. This would, in other words, mean the dating would be EB I and not Chalcolithic. He also notes that there are stylistic similarities between this hoard and the style of the ossuaries from sites such as Azor, also dated to EB I. However, for the present, the dating of 3500 BC or earlier is the most accepted. A recent addition here is Aardsma's (2001) dating of the reed mat, placing it in the mid 5th millennium BC, a date which opens up more debates on the topic.

The hoard had a composition of copper, particularly arsenical copper, which is not known in the southern Levant. This has led to much disagreement on the origin of the hoard. Based on the metal composition, Key (1980:242–3) suggested that the Nahal Mishmar objects came from eastern Turkey or the adjacent parts of Iran, possibly also Azerbaijan, as 'similar' ores are known there. Moorey (1988b:185–7), on the other hand, suggested that the arsenical copper had been intentionally added and that the hoard may have been cast locally, rather than imported from the north. Tadmor (*et al.* 1995:141) has recently suggested that the origin of the 'prestige' copper artefacts from the Chalcolithic period containing antimony-arsenic rich copper was eastern Anatolia, the Caucasus or Iran. Recent technical aspects will be dealt with further in Chapter 6. What seems clear is that the technical evidence of the copper artefacts, the comparative aspect and radiocarbon dates place the find in the mid-4th millennium BC (cf. Bar-Adon 1980; Eldar and Baumgarten 1985 and others), and at least the raw material probably has an origin in Anatolia or Iran, as Tadmor *et al.* (1995) suggest.

Interpretations and context

The excavators clearly state that the treasure in Cave 1 was hidden in a crevice and that this part was sealed off from the burials and the habitation area of the cave. Bar Adon (1980:7) has suggested it was probably hidden towards the end of the occupation of the cave in the Chalcolithic period. On the basis of Bar-Adon's interpretation, Moorey (1988b) has suggested that the find is a hoard because it was hidden in a crevice and partially covered by a mat of cypress. He argues that there is nothing that suggests that this was a votive deposit associated with religious rituals performed in the cave (Moorey 1988b:182). On the contrary, he focuses on the utilitarian aspects of the hoard, with a concentration of wealth intentionally concealed at a time of stress, which survived by accident because the owners were not in a position to recover it. This suggests the 'treasury' of a community or, in other words, a primary context of storing wealth in a pre-monetary society (Moorey 1988b:182–3).

Several writers have argued that there was a close relation between Nahal Mishmar and Ein Gedi, a site 10-15 km to the north of Nahal Mishmar. Ussishkin (1971, 1980) has suggested that the artefacts from Nahal Mishmar stem from the site of Ein Gedi and were hidden in the cave in times of unrest. This, however, does not explain the burials, especially if they are contemporary, or the pastoral aspects of Nahal Mishmar. Subsequently, petrographic analysis of the pottery has proven that Ein Gedi and Nahal Mishmar are of different ceramic families (Gilead and Goren 1989), although these analyses alone do not tell us much about the social processes that have taken place.

Garfinkel (1994) has suggested that the 'hoard' may represent the ritual burial of cultic objects, a tradition found earlier and later in prehistoric and historical periods. As the objects

were not recycled and the location was in the arid zone of the Judean Desert, Garfinkel (1994:176) has suggested that the copper artefacts were intentionally buried as they had become unsuitable for continued ritual practice. His basis for interpretation is that the artefacts were wrapped up in mats in no particular order and that knobs were broken off some of the artefacts before being deposited in the cave. Garfinkel (1994:176) suggests that this treatment reflects a ritual burial because the objects were wrapped in mats in much the same way a human corpse would be treated. The damage on the objects themselves is what would be expected from old and used items. This interpretation is highly possible, but does not necessarily link the burials and the 'hoard'. There is relatively little evidence of a hoard proper, where one would also expect that many of the artefacts would be intentionally destroyed—this is not the case at Nahal Mishmar.

Along slightly similar lines, Golden (1998:86–9, 137) has recently suggested that Nahal Mishmar, along with Palmachim and Piqe'in, should be considered as a burial or tombs. This is based on an unpublished paper by Ilan, who argues that the importance of burials has been underestimated as there are also similarities elsewhere. Golden (1998:87) suggests that these burials represent extended families, which may be the case. However, the relation to the metal artefacts is unclear and it is questionable how one may ascribe these to the burials themselves. Further, an explanation of how these burials are related to the 'grave' goods is needed. Although Nahal Mishmar is exceptional, it must be regarded as an anomaly; there is nothing like it anywhere else which could function as a basis of comparison. Golden (1998:139–40) has suggested that the complex castings from Nahal Mishmar stem from grave contexts, implying that these objects have a certain social significance which took them out of circulation. However, there are few 'personal' types of artefacts found in the hoard and, most importantly of all, the burials in the cave and the metal finds are clearly separated.

Of interest here, apart from the finds in Cave 1, is the enclosure found on top of the cliff above the cave. The pastoral connection of the metal finds, as argued by Gates (1992), may also be seen in relation to the churn fragments found in Cave 3 (cf. Bar-Adon 1980:143). As mentioned, the clay figurine, clay stoppers, lithic material, pestle, mortar, loom accessories, etc. are linked to a pastoral dimension. Gates (1992) and Tadmor (1989) have both suggested itinerant craftsmen, but Gates has highlighted pastoral elements in the hoard—with a possible transhumance connection to wherever the artefacts were brought from by pastoral nomads. Iconographic representations in the hoard, such as the sceptres and standards, are suggested by Gates to bear similarities to those of pastoral nomads. She suggests, therefore, that the hoard should be seen within the context of a nomadic economy, in which important elements of transmission patterns of the metal technologies in the region are supplied (Gates 1992:137). More recently, Tadmor (*et al.* 1995) has suggested that there are many 'utilitarian' types of artefacts produced by the same technological manufacturers as the 'prestige' types. Moreover, many of the 'utilitarian' types have never been used. This underlines the importance of these objects beyond the utilitarian and functional domain at a period when copper is rare, and at the same time, they have a functional purpose on the social level by creating institutions and legitimizing power in a period of great change. Focus would be increased not only on secondary products, such as milk and wool, but on the link to the distribution of metal over large distances where pastoral nomads played a significant role.

Specialization, Burials and Sanctuaries: A Rising Elite and Collapse?

There has been much attention placed on the nature of the social hierarchy of the Chalcolithic period. The chiefdom model of Service (1962) has been the basis for Levy's (e.g. 1986, 1998b) approaches to the Chalcolithic period, suggesting that sites like Shiqmim and Ghassul are hierarchally organized societies with an organized plan. Mobile groups of sheep and goat herders, in what may be defined as village-based pastoralism or as mixed economy, are included. Thus, the development of chiefdoms is connected to specialized pastoralism. In this picture, Levy (1998b) has also suggested that the Chalcolithic societies of the southern Levant consist of a number of regional and sub-regional cultures. On the other hand, Gilead (1988) has suggested that the Chalcolithic societies were not hierarchical, but egalitarian and organized as many other large prehistoric farming settlements. He regards the societies as independent and non-centralized with both a sedentary farming and non-mobile pastoral production, such as cattle and pig, while the pastoral production played an insignificant part in the economic sector (Gilead 1994). The general interpretation is that this is a period of chiefdoms, characterized by a two-tier settlement hierarchy, with centres and smaller satellite sites that are the result of the specialization not only in metallurgy, but also in ivory, pottery, flint (Rosen 1984) and basalt, etc. (cf. Levy 1998b). More recently, Golden (1998:148), following Levy, has suggested the modified model of the restricted access to metal hypothesis, suggesting a two-tier hierarchy system and using Gilat as an example. However, several of these centres do not have any evidence of copper working which is confined to sites in the Beersheba region. This is based on Earle's (1991) model of specialization and production of wealth, which differentiates between utilitarian goods produced by independent specialists and ritual items produced by attached specialists. Trade and craft specialization has been a central component of the analysis of the Chalcolithic period and the development of complex society (Rosen 1986, 1992). Levy's model focuses to a great extent on increased competition due to new technologies, such as metallurgy, and developments in agriculture leading to increased specialization, which may be identified as a two-tiered chiefdom (cf. Levy and Holl 1988; Levy 1998b). Levy (1998b) describes the Chalcolithic societies of the southern Levant as the first complex societies, or rather to be more precise, the period in which complex societies develop. Recently, Kerner (2001) has studied craft specialization during the Chalcolithic period and its impact on social complexity, based on pottery, metal, basalt bowls and fan-scrapers. She illustrates clearly that there are numerous indications pointing to a more complex organized society in the late Chalcolithic period, though with regional differentiation. In this context Christaller's Central Place Theory using Theissen polygons has been used by Levy (1986:99–100) to explore the relation between larger settlements and their territories. Levy here used a combination of Hodder and Orton's (1976) geographic method connected to rank and size, and Renfrew's (1975) model of space in complex polities and interpolity interactions. This is of course a theoretical approach, but may give understanding of smaller sites and their relation to larger sites, often functioning as economic and religious centres as in the cases of Shiqmim and Ghassul (cf. Scham 1999:274). However, the theory is based on a 'modern' pre-war German setting where Christaller's spatial regularity was based on universal physical distribution. In archaeology particularly, distance and size has been significant. The central issue here is to understand the use of space in a much broader sense including economic, social, religious and political aspects. Further in a context of pastoral nomadism and settled agricultural societies, the boundaries and territories may be both fluid and overlapping.

Concerning burials of the Chalcolithic period, there is a number of striking features, such as the formal cemeteries with cist graves, found in the vicinity of Shiqmim and other sites in the Beersheba region, although, these do not indicate a high degree of social differentiation or specialization. Floor burials are also known from a number of sites such as Ghassul, though these are generally connected to small children or foetuses. At Tel Teo, three burials were found in the Chalcolithic occupation layer beneath the floors of rooms constructed in the courtyard. They were laid in a flexed position, inhumation, with no grave goods or markers above (Eisenberg 1989:34). This is similar to the burials in floors found at Ghassul where the remains were all children and infants (Scham 1999:33). The clay ossuaries generally found in caves across the southern Levant, often shaped as houses of clay, are secondary burials. At Peqi'in in Galilee a recent discovery of ossuaries was found together with two copper adzes and two standards (see also Chapter 6). Both the megalithic dolmens and the nawamis of Sinai may belong to the very late Chalcolithic, though they seem to be a more prominent feature in the EB I and are therefore mentioned later.

During the latter half of the 4th millennium, most sites of the northern Negev and the Golan heights were abandoned. Ben-Tor (1992b:82) points out that, 'In the late fourth millennium BC, the Chalcolithic culture in Palestine disappears under unclear circumstances, and a new epoch in the history of Palestine begins'. This is striking as it seems that it is in fact during the first half of the 4th millennium that the Chalcolithic societies are truly blooming, with the introduction of metal and continuously increased contacts both with northeast Africa and the northern Levant.

As we see, the Chalcolithic period seems relatively innovative with major social, technological and economic changes. It is not clear to what degree the period actually represents a period of migration, though there are elements evident from the Late Neolithic period continuing into the Chalcolithic. Furthermore, there are two major changes at this point in time: specialized pastoralism seems to be more clearly evidenced (see also Chapter 5), and metal and metallurgy are introduced, as exemplified by the enigmatic hoard of Nahal Mishmar. Both these features demand long-term social changes towards a more complex society, though there still seems to be strong collective and communal emphasis and focus. During the period, there tends to be clear local variation within the southern Levant that reflects a mosaic of different adaptations and specializations found in the region, but neighbouring regions are now taking steps towards *really* complex societies.

The Early Bronze Age I

Traditionally, the Early Bronze Age is regarded as a period of increasing complexity, although the picture of the period in the southern Levant is still relatively unclear. In general, EB I and the succeeding periods of EB II and EB III lead to the appearance of a more stratified and urban society in the southern Levant. This section begins with a brief consideration of chronological aspects, before looking into the nature of the EB I, which mirrors both continuity with and change from the preceding period. Thereafter, EB I will be discussed in terms of houses, pottery, burials and flint, as well as a closer examination of adaptation and the economy, and whether it leads to growing interregional contacts and relations. Lastly, there is a brief consideration of whether EB I can be seen as a transitional stage towards the first urban societies in the southern Levant.

Chronology and Terminology—the Last Centuries of the 4th Millennium in the Southern Levant

For a long time there have been only minor disputes in reference to the chronology and terminology for the last centuries of the 4th millennium. Garfinkel (1999a:table 3) suggests that EB I should be used for the period 3600–3100 BC, mainly covering the Proto Urban A, B and C periods which were coined by Kenyon (1979) and her excavation at Tell es-Sultan in Jericho. Some researchers though, tend to divide the first period of the EB into phases A and B (cf. de Vaux 1966; Gophna 1998). Although Gophna (1998) refers to EB Ia and EB Ib, he does not really use it or explain the difference between them. Levy (1998c:xvi) places the EB I between 3500 and 3000 BC, while Ben-Tor (1992a:2) dates it between 3200/3000 and 2950/2900 BC. In this latter case, EB I is more or less reduced to small phase or interlude. Esse (1989:83) dates it between 3500 and 3100 BC. Recently, Philip (2001:168–9) has divided EB I into early EB I (3600–3400/3300 BC) and late EB I (3400/3300–3100/3000 BC). However, recently there has been an increased debate and evidence connected to the transition from the Chalcolithic to EB I (cf. Avner and Carmi 2001; Bourke *et al.* 2001; Braun 2001; Burton and Levy 2001; Bruins 2001; Bourke *et al.* 2004). The radiocarbon dates from major sites such as Shiqmim (Burton and Levy 2001) and Ghassul (Bourke *et al.* 2001; Bourke *et al.* 2004) now clearly show that the sites terminal occupation ends c. 3800 and 3600 BC, which is earlier that previously thought. Avner and Carmi (2001) illustrate that there are no gaps in the settlement pattern at sites in the southern Levant desert, and Braun (2001) points in the direction of 'older' EB I dates, although he is hesitant to accept this. In terms of timing this makes the Chalcolithic shorter and the EB I respectively longer with c. 200–300 years. This is consistent with more recent dates from EB I sites such as Afidar, Tell Shuna North and Aqaba (Bourke *et al.* 2004:315, with references). In other words the end of the Chalcolithic and the beginning of EB I is pushed earlier than what previously has been accepted. This has also illustrated by Savage (2001) in connection with the Naqada II a/b to Naqada II b/c transition. This means that the end of EB I can be correlated with the First Egyptian Dynasty. In any case, there are no major differences, and basically this outline will follow Levy and others, placing EB I in the last half of the 4th millennium, setting the stage for the EB II in the Levant and the fundamental changes to come. As will be shown later, it is slightly paradoxical that this period begins the Bronze Age, as it has less bronzes and no evidence of bronze working, especially when compared to the preceding Chalcolithic period.

The Nature of the EB I: Continuity and Change

Most researchers agree that some kind of change in settlement pattern is evident from the Chalcolithic to the EB I (see Fig. 3.6). Although some Chalcolithic sites continue to be used in EB I, the nature of the archaeological material changes dramatically. Ben-Tor (1992b:93) argues that in EB I, it is likely there were population movements, where at least part of the population came from the north, though he plays down the role of Egypt. This is especially suggestive on the basis of house pattern, pottery and seal impression. However, there is also a number of new sites established, which Gophna (1998:269) sees as the development of a new settlement pattern. The 'core areas' of the Chalcolithic, such as Beersheba and the Golan, collapse or disappear and are basically not found in EB I. However, in a larger setting this also marks the end of the Uruk colonies on the periphery of Mesopotamian plains, and might be related to larger regional changes. The major sites of the Chalcolithic period are

never reused. This must be seen in relation to the relatively small number of known sites in the Galilee and Judean hills, and little is known of EB I settlements in desert regions, such as Negev (Gophna 1998:269–71). The transition from EB I to EB II is generally regarded as the development of the first urban city states in the southern Levant. Based on settlement pattern analysis, Portugali and Gophna (1993) suggest that the changes they recorded for the EB I were not only connected to the urbanisation process, but are also representative of a major crisis within EB I society, resulting in temporary nomadization and population movements, where sites 'shrink' and others are deserted or abandoned. In the transition from EB I to EB II stability is regained shortly thereafter. Unfortunately, there are few explanations as to *why* there is a collapse of Chalcolithic societies or the reasons behind the instability at the end of EB I except for the focus on migration and nomadization. This will not be dealt with further here, but one may ask what social processes led to migration and nomadism.

New settlements in the Early Bronze Age were established in the hills, plains and valleys where the Mediterranean climate prevailed, such as Dan, Hazor, Beth Yerah, Beth Shean, Ta'anach, Megiddo, Tell el-Farah North, Ai, Gezer, Jericho, Yarmuth, Lachish, Tell Hesi, Arad, etc. These were all away from the earlier semi-arid and steppe zone areas used during the Chalcolithic (Ben-Tor 1992b:83). Most of the EB I sites seem to be in regions where there are more than 300 mm of annual rainfall, often in the proximity of springs or oases (Ben-Tor 1992b:84). Few sites along the coast are known until early in the 2nd millennium BC, a bleak contrast to Byblos and Ugarit, which are further to the north. Surveys and excavations (cf. Oren 1973; Amiran and Gophna 1989; Esse 1991) point to a relatively dense settlement pattern in the latter half of EB I, which has also led to arguments of a population increase during this period (Gophna and Portugali 1988; Amiran and Gophna 1989). There is a change of pattern in EB II with a decline in small sites, due possibly to the merging and growing cities (Amiran & Gophna 1989:110).

As Gophna (1998:269) points out, the characteristic feature of the very beginning of EB I has been its relation to the preceding Chalcolithic period when considering settlement pattern, pottery, flint, copper artefacts, burials, etc. In contrast, other researchers, such as de Vaux (1966), see the two periods as two different cultures with an influx of new people. Blackham (2002:100) argues that EB I pottery breaks significantly with that of the Chalcolithic, as there are new motives and styles. While others relate this to internal development based on stylistic continuity from the Chalcolithic to EB I (Hanbury-Tension 1986; Braun 1989), Blackham sees it as unlikely that all the new stylistic changes can be attributed to local causes, theorizing that these changes must be a result of drastic social change, where he favours large-scale migration rather than warfare. Another possibility is that the abandonment of Chalcolithic sites in the Jordan Valley coincides with the development of major sites at a higher elevation, a process already begun in the Chalcolithic period. 'Such a change in settlement patterns could possibly be attributed to the domestication of the olive, a fruit that grows best in terra rosa soils at higher elevations' (Blackham 2002:101). This in fact may also be seen as an adaptation to the growing demands of Egypt, where, among other perishable goods, olive oil and its products were important, but these issues will be revisited. This is part of the economic change towards a more specialized economy, which is evident in the EB II and EB III meeting interregional demands, and having far-reaching political and social implications on the societies of the southern Levant (Esse 1991). In other words, an orientation towards demands from Egypt, where, due to ecological differences from Egypt, the southern Levant had the possibility and the opportunity to produce highly desired products.

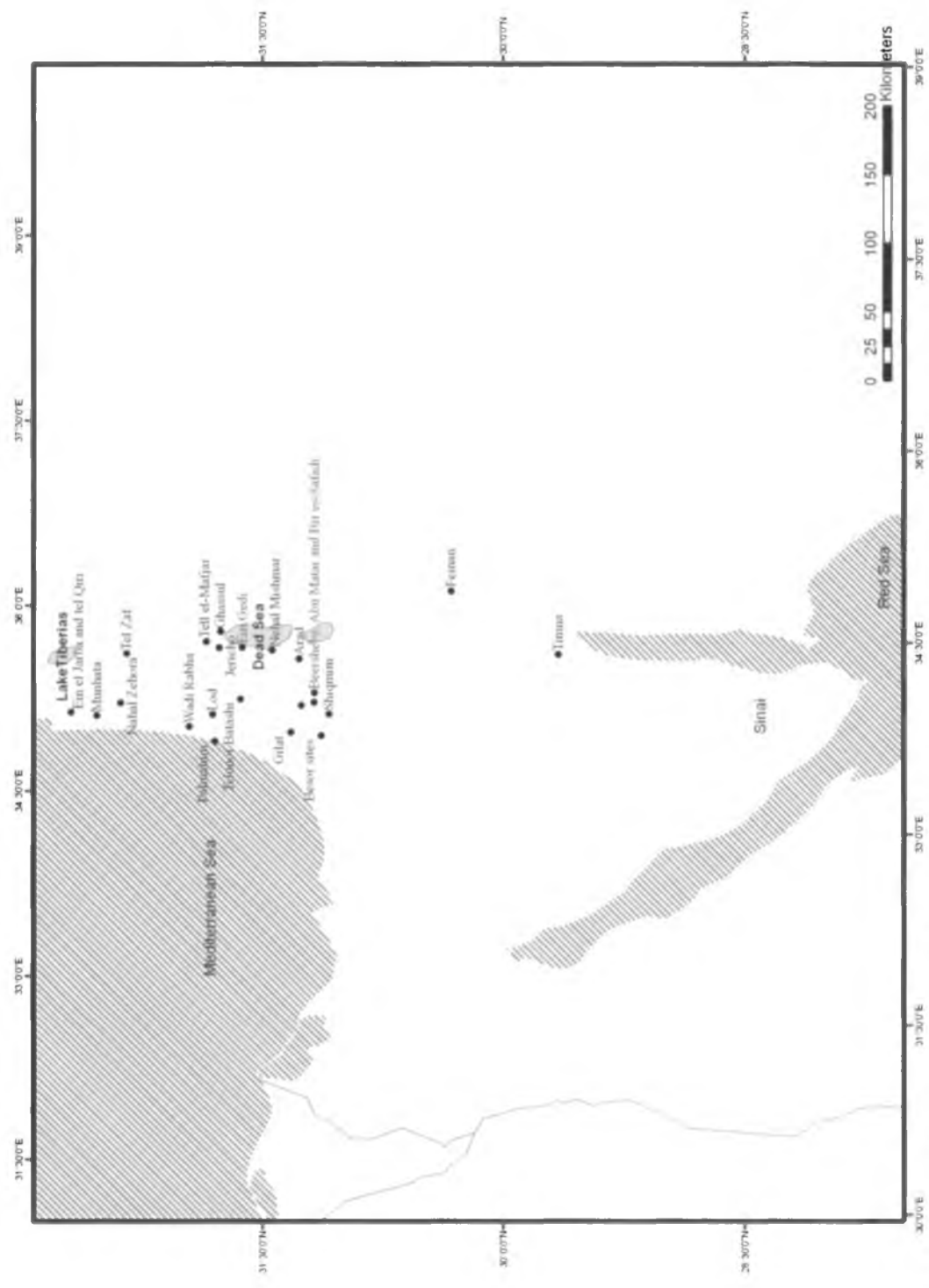


Figure 3.5 Major EB I sites mentioned in the text.

Early Bronze Age I—Houses, Pottery, Burials and Flint

Settlement houses are generally made of bricks and do not seem to have a fixed plan, consisting of only a few rooms, a courtyard and a silo for storage (Ben-Tor 1992b:86). One special structure of the period is the apsidal house, which has been found at a number of sites in the southern Levant. Its function and origin is not known, though Ben-Tor (1989:46, 1992b:87) suggests the Syrian-Lebanese coast. However, there is great diversity and difference in architectural features, and as pointed out by Philip (2001:178), this also includes circular and rectilinear multi-roomed structures, such as those found at Tall ash-Shuna and other sites. There are no known fortifications until at the end of EB I, or the very beginning of EB II (see Philip 2001:182, table 5.3), except for Jawa (Betts 1991a, fig.5). It is also striking that some of the EB I centres do not develop into major EB II centres (Philip 2001:183). In addition to the more permanent structures interpreted as belonging to a sedentary agricultural population, there is also evidence of temporary structures, such as the lowest levels at Bab edh-Dhra and En Besor, the latter having a pebble floor and both interpreted as huts (Hanbury-Tenison 1986:193–4). Furthermore, there is also a number of pits, possibly habitation pits, filled with rubbish or intentional deposition—a practice that seems to end in EB I (Hanbury-Tenison 1986:194–9). There is also some evidence that caves have also been used for seasonal occupation. According to Ben-Tor (1992b:87), structures found at a number of sites, such as Jericho, Ai and Megiddo, may be possible cultic structures or temples. Ben-Tor (1992b:91–2) suggests further that the temple at Megiddo has striking parallels to the Chalcolithic temple at Ein Gedi, where there was a process of newcomers merging with the old Chalcolithic population. However, the major difference from the Chalcolithic is that during EB I, these temples or shrines are found within settlements, rather than at more peripheral places such as Ein Gedi. Furthermore, such a hypothesis is rather circumstantial and it is questionable to what degree there is a change in the population. A change in settlement pattern, material culture or both does not necessarily imply a new migration group entering the country.

There is a large assemblage of pottery dating from the late 4th millennium, which has been intensely studied from a typological, chronological and technological point of view, and provides sequences for a special type of pottery through typological studies. Esse (1989:84) sees the various pottery styles as a reflection of regional fragmentation with a limited degree of specialization, suggesting that the EB I pottery traditions are closer to the previous Chalcolithic and Neolithic periods. In any case, the primary concern here is to point out some similarities in pottery, and the possible implications on a general level. Any detailed typological analysis is beyond the scope of this book. There seems to be some continuation in the pottery traditions from the Chalcolithic period, especially the holemouth jars, some bowls, basalt vessel and the grey burnished wares (Ben-Tor 1992b:90). However, it has been suggested that many forms come from the Syrian and Lebanese coast (Ben-Tor 1989:46–50, 1992b:90). A special feature in some pottery is the cylinder seal impression present at sites such as Megiddo. It is possible that this derived from Syria or Byblos, which had extensive contacts with Mesopotamia (Ben-Tor 1992b:91). The problem is that the majority of material originates from burials, rather than stratified deposits, making a construction of an interregional pottery chronology difficult (Philip 2001:170). Philip (2001) suggests that the pottery represents a rich and complex network of shared values underpinning the societies.

At Tel Teo (Ain Jahula) both Chalcolithic and EB I are recorded among other periods, where the EB I had differences in architecture, pottery and lithic artefacts compared to the

preceding period. Here, the houses were curvilinear, similar to other EB I sites (including Byblos), new pottery forms are exemplified, and a decline in both the quantity and quality of flint tools was evident compared to the previous Chalcolithic period. A special feature on this site was the intra-site, three-infant burials; two were found below the house floor and one beneath the foundation of a house (Eisenberg 1989). At Bab adh-Dhra' one tomb was a shaft and chamber grave (Philip 2001:197, fig. 5.8), where several individuals, both adults and children, were found disarticulated in a pile in the centre, together with a large number of gifts, the majority of which was pottery. Limestone mace-heads, shell bracelets, basalt bowls and clay figurines were also present. Some of the later EB I graves are circular mud-brick structures with a semi-circular forecourt (Philip 2001:197). During the EB I, the most common burial form is in caves found at sites such as Jericho, Azor, Ai and others, shaft tombs are only known at Bab edh-Dhra, which is exceptional, and all graves lack of uniformity (Ben-Tor 1992b:88). The mixed up bones suggest interring or continued use of the same burial site over a relatively long period of time by a group, lineage, etc. Secondary burials are also known, especially at Bab edh-Dhra, but cremation is also evident as at Azor and Gezer. The various burial practices differ, however, from the informal cist graves, known from the Chalcolithic period. There are also three different, clearly defined pottery traditions, which are associated with EB I burials (cf. Hanbury-Tenison 1986:231).

The megalithic funerary monuments called dolmens, built on prominent places in the landscape of the southern Levant, have often been connected to a special form of socioeconomic organization—pastoralism (e.g. Bahat 1992; Zohar 1992; Herzog 1997). Shaft and chamber graves have on the other hand been connected to sedentary communities (Philip 2003:117, with references). However, it is doubtful if such a simplistic division may be sustained and the increasing number of dolmens may, as Prag (1995) suggests, be the normal burial mode. Stekelis (1961) suggested that dolmens may have been built by people who were agriculturalists. An interesting factor is that these dolmens or megaliths have generally been dated to EB I (or EB IV), rather than EB II and EB III, and they seem to have a relatively clear geographic distribution on the eastern side of the Jordan Valley, with some exceptions in western Galilee and Carmel (Philip 2003:118). Nevertheless, dating must be treated as circumstantial, as the tombs generally lack datable material. In Jordan, dolmens from Damiyeh, Wadi Hisban and the plateau south of Amman are all dated to EB I (Yassine 1988). Those from Adeimeh in the lower Jordan Valley are dated to the Chalcolithic (cf. Bourke 2002). These monuments tend to cluster and are especially found along the escarpments and eastern slopes of the Jordan Valley, but they are also found further to the north in the area east of Jarash, encompassing a number of different environmental zones (Philip 2001:201). One dolmen, near Tall al-Umayri, southwest of Amman, was an undisturbed tomb containing more than 20 individuals. Here, it was apparent that the earlier burials were pushed aside and outside the tomb was an area with a plaster surface (Philip 2001:201–2). Under dolmens in the Golan, late Chalcolithic houses have been found (Epstein 1985a). Another burial form is the nawamis of the Sinai, which was probably used as a secondary burial form by a pastoral population. These circular structures are built in stone, and contain grave goods, such as copper awls. Nawamis will be returned to in greater detail in Chapter 5, during the discussion on nomadic pastoralism in the region.

Under any circumstances, burial practices in EB I lack standardization. One feature detected in burials from the Chalcolithic to EB I is a greater and more widespread emphasis on personal objects, ornaments and weapons compared to earlier periods. On the other

hand, there is also a focus on the community and family through the use of dolmens, which likely displays an increased focus on marking territory.

To date, the most prominent and extensive work on late lithic material to be completed, has been done by Rosen (1982, 1997). Rosen (1997:106–10) divides the EB I lithic assemblages of the southern Levant into three different industries (excluding what he regards as Egyptian elements): the Canaanean sickle blades, the tabular scrapers and *ad hoc* tools. Subsequently, desert assemblages during the Early Bronze Age seem to have additional elements that are not found on the settled sites, with the sole exception of the tabular scraper. One of the most distinctive features of lithic material in the EB is the so-called Canaanean blades and sickles. These have long parallel sides and a distinctive trapezoid cross-section often with one polished edge. The other distinctive feature is the tabular scraper, also well known in the Chalcolithic and acknowledged to be quarried in Negev and Sinai (Rosen 1997:75). It is also noteworthy to consider this tool as being specialized in the absence of metal, because this would have great economic impact with respect to agricultural activities. Often the EB tabular scrapers have incisions on the cortex of the dorsal surface, which is unknown in the Chalcolithic (cf. Rosen 1997:fig. 3.1). Rosen (1997:109, with references) suggests that this might be an indication of a long-distance distribution by pastoral groups. He (Rosen 1983) has also suggested a decline in the distribution of scrapers corresponding with the sources in western Negev. Henry (1995:372) has proposed that the scraper might have been used for shearing wool, which in fact would have important implications for the development of large-scale textile production (Philips 2001:211). A factor of significance is that the scraper is already well known in the Chalcolithic and this would support the utilization of wool in this period. With regards to the tabular scrapers, Rosen (1997) has clearly shown that they are found throughout the Chalcolithic and the Early Bronze Age, but that they disappear thereafter. Rosen (1997:162–3) has proposed two reasons explaining why the tabular scrapers survived the Chalcolithic-EB transition:

1. The scraper had a symbolic meaning not connected to economic forces like other tools, possibly rituals. Although there seems to be a ritual transformation from the Chalcolithic to the EB I because copper objects did not continue, the scraper may have been linked to other ritual activities.
2. The scrapers were attached to a desert-heartland trade system, where the same people who were engaged in the tabular scraper trade were also engaged in the metal trade.

The *ad hoc* tools are, according to Rosen (1997:107), reflective of an unspecialized, intrasite, lithic industry, including production, use and discard. This mirrors minimal specialization and exchange of lithic artefacts, which he argues in accordance with the pastoral nomadic systems from which they derive. The latter point may also be supported by Quintero (*et al.* 2002) who has discovered a flint mine for the production of fan scrapers amongst others in the el-Jafr basin of southeast Jordan. They suggest that pastoralists were engaged in this activity, possibly on a seasonal basis and connected to a wider exchange network.

Adaptation and Economy

Knowledge about the economy is limited, but sheep and goat do not seem to play as important a part as earlier. In addition, the distribution of cattle and pig is reduced. Agriculture seems to have been based on crops known in the preceding Chalcolithic period, although there

is an increase in scale during EB I. This leads to the establishment of the 'Mediterranean' economy, which is recognized well into the most recent historical periods, with its basis on sheep and goat, as well as olive, grapes and other fruits (Ben-Tor 1989:41). These factors may also lead to a population growth in the region in the following period. Metal artefacts were known, but they are fewer in number and there are no traces of metallurgy (see Chapter 6). A common factor when considering social organization and complexity is craft specialization and the practice of metalworking, and its implications will be discussed further in Chapter 6 and 7. Yet, the nature of the sites themselves does not offer a good indication of specialization in any form beyond the normal household specialization connected to pottery and lithic tool production. The only possible exception is basalt vessels (Philip and Williams-Thorpe 2000).

Bar-Yosef (1992:90) sees a development from the Chalcolithic to the EB I in terms of improvements and variations, all being of northern origin. Philip (2001, 2003) has suggested that there are a number of key economic changes that take place in the Early Bronze Age. These were practices already developed and acknowledged in the preceding Chalcolithic period, but refined and intensified during the Bronze Age, such as irrigation agriculture, agriculture using ox-drawn ploughs, tree-crops, etc. Still, most of these factors are more clearly seen in EB II and EB III. According to Philip (2003:107), this specialization and intensification leads to a restructuring of the social organization in order to meet Egyptian demands for specialized agricultural products. Additionally, there seems to be a relatively large degree of continuity in the environmental factors determining the location of sites in the Chalcolithic and EB, because the major wadi systems with good fertile soil and water supply continue to be used (Philip 2003:110). Philip (2001:196) proposes that in Jordan, especially in the arid zones in the south and east, settlement patterns indicate the emergence of mobile animal herding. This is a different, possibly regional system of specialized livestock management, providing secondary animal products for sedentary communities. This develops quite late as compared to the specialized mobile herding systems described in the south-western part of the southern Levant. However, Philip (2001:196) suggests that there might have been fluctuation, depending on local environmental, social and economic forces.

Esse (1991) has demonstrated that the medium-sized, EB I settlements in the northern part of Palestine are often located in fertile, well drained agricultural land, while in the Jordan Valley, there seems to be a higher dependency on pastoral production. He suggests that the population probably increased from the Chalcolithic to the EB I, but that there does not seem to be a radical shift in the location between the two periods. This is in fact dissimilar to propositions made by Blackham (2002), regarding the Lower Jordan Valley, and Levy (1983) about Nahal Besor, who both see a shift in the subsistence. Esse (1989:83) perceives the economic split between specialized pastoralism and increased dry farming as an even more important factor in subsistence in EB I than in the preceding Chalcolithic period. All EB I settlements along the coast seem to be small unfortified agricultural villages (Esse 1989:83, with reference to Gophna 1974). Esse (1991) suggests that the economic system of EB I was less centralized and less internally integrated than the succeeding EB periods II and EB III. Esse (1991:fig. 33) describes the EB I economy as a 'mixed economy (fluid)' consisting of both herding and farming. The agricultural production seems to be much the same, with a difference in scale of production, rather than technological differences. In any case, agriculture seems to have been the economic basis for the EB I societies of the southern

Levant, as had been the situation earlier, and it was this economic basis that was activated through the new demands of the social elite of Egypt.

Trade and Contact: Growing Interregional Relations?

The depiction of trade or contact with Syria and Anatolia to the north is much less clear than for Egyptian contacts, although Ben-Tor (1992b) and others see some architectural connections to Syria and Lebanon. There is some evidence of contact with the northern Levant and Mesopotamia/Anatolia, but this appears to be less conclusive during EB I. The cylindrical seals may be one such indication (cf. Ben-Tor 1989, 1992b; Philip 2001). Gophna (1998) has also suggested a possible EB I link with Lebanon, although he favours the idea that EB I is a period of regional abandonment followed by resettlement. Still, there may be some connection with the late Uruk expansion in the upper Euphrates, but this remains unclear. At the end of EB I, with the consolidation of the Egyptian Dynasty and expansion of the economy, there seems to be a shift from overland to sea trade between EB I and EB II, as proposed by Stager (1985:n.3, 1992).

Gophna (1998:272) has suggested, on the basis of differences in pottery assemblages (between the Chalcolithic and the EB I), that there were new socio-cultural developments taking place further to the north under the influence of Mesopotamia, when groups came to the deserted southern Levant and reshaped their material culture, also possibly joining surviving Chalcolithic groups. He argues that sites in the southwest of the southern Levant develop much closer interregional, long-distance trade with Egypt. Gophna (1998:277) suggests that the intensive archaeological research on the EB I has revealed that the southern Levant was one part of a larger system of interregional connections between Egypt and western Asia. The economic basis of the southern Levant also created a surplus and the possibility of the accumulation of wealth, due to interregional trade and the development of urban centres in the region. The donkey with a pair of vessels on its back found at Azor has been used a great deal as an argument for the development of transportation technology with the use of new domesticates (cf. Sherratt 1981). Two figurines of an animal bearing a pair of vessels have also been found at Aphek, with another in a EB II context at Arad (Ben-Tor 1992b:93). Philip (2001:188) is open to the possibility of animal transport being used in the Chalcolithic, and he argues that the evidence and need for pack donkeys became clear during EB I. 'In fact, it is hard to see how EBA societies could have developed as they did in the absence of extensive movements of people, technical knowledge and commodities' (Philip 2003:121). Still, the communication network of the earliest period of the Bronze Age is still poorly understood. When taking into account the preceding period and the nature of the EB I, it is in fact possible to develop a merging picture of these societies. EB I tombs from Baba adh-Dhra' and Tall Magass excavations have revealed bracelets made of shells from the Red Sea region, and similar items have been found in Palestine, Sinai and Egypt (Philip 2001:216), clearly pointing to a system of wide contacts.

During EB I, there seems to be a gradual intensification of exchange with Egypt. According to Gophna (1998:277), a number of excavations have revealed increased contacts between these regions during EB I as evidenced at several large sites, such as Arad, Tel 'Erani, En Besor and others. Here, increasingly more Egyptian artefacts are found at the sites dated to Naqada II, III/'Dynasty O'. Some are larger sites, while others seem to be small seasonal encampments. The impact of trade is not only evident at Maadi which is probably connected

to overland trade, but it is also seen at Buto, further north in the Delta, where direct contacts with the northern Levant and the fringes of Mesopotamian civilization seem to develop. Ben-Tor (1992b:93–4) notes that there are incised pottery shards from both Arad and Tel 'Erani, bearing the incisions of the Egyptian King Narmer. In addition, several Egyptian seal impressions were found. At the cemetery at Azor, burials had numerous gifts such as Egyptian pottery, a cosmetic palette decorated with figures or birds, beads and a flint knife. The cosmetic palette is also common in Predynastic Egypt and in the Nubian A-Group where it is clearly connected to female burials. As Esse (1991:175) points out,

> Extensive trade between Egypt and southern Palestine was vigorous as early as EB I. Palestinian pottery has been found at Maadi and as far south as Nubia. The string of EB I campsites along the northern Sinai route between Egypt and southern Palestine and the amount of Egyptian material at 'Ein Besor, 'Erani, Lahav and Arad all attest to the importance of the exchange. In Palestine, the string of EB I sites along the coast, some of which yielded Egyptian objects, helps track the direction and extent of the overland trade route. With the establishment of the First Dynasty in Egypt, the nature of the evidence for connections between Egypt and Palestine changes.

This interregional exchange led to subsistence patterns and population growth. Continued trade in EB II leads, then, to the urban development of the southern Levant. Esse (1989:84) also reasons that trade routes seem to have been overland, along the northern coast of Sinai and mainly consisted of prestige items. This is seen particularly in the pottery and the seals from En Besor and Erani, in addition to the slate palettes mentioned earlier, also found at Jericho and Azor. Whether these are trading stations, Egyptian sites, or colonies remains unanswered.

The flow of goods from Palestine to Egypt seems to be less significant in number and variation, according to Ben-Tor (1992b:94). Vessels from the southern Levant have been found at several Lower Egyptian sites, such as Minshat Abu-Omar, El-Gerze, Naqada and Abusir el-Melek. This is also the case for pottery found in the Proto-Urban (A and B) tombs in Jericho, which also are recognized in the Egyptian Delta and its interior (Ben-Tor 1992b:95). Long ago, Yardin (1955) suggested that the Egyptian archaeological material in the southern Levant represented an Egyptian occupation. On the other hand, Ben-Tor (1989:43) proposes that the Egyptian material represents economic ties and even political domination over parts of the southern Levant during EB I, but that the cultural impetus came from the north. Nevertheless, with the exception of the argument that the societies in Egypt and the southern Levant were too different, there is no focus on the social dynamics explaining this strange situation of economic and political domination from the south, while at the same time there is cultural orientation towards the north. More recently, there have been several studies focusing on subsequent interaction between the southern Levant and the Nile Delta (e.g. Edwin and van den Brink 1993). Braun (*et al.* 2001) has suggested several focal sites for interaction, but this seems to have been relatively limited during EB I when compared to later periods. It is possible that the southern Levant was influenced by both, with a stronger influence in the southern parts by Egypt and in the northern parts by Syria and Lebanon. This would consequently result in the lack of a 'southern Levant region' at the time, as there would be other areas of focus and interaction, which are totally different from what we perceive today. In other words, this may point to an interaction sphere where Egypt and Mesopotamia (Lebanon and central and northern Syria) met, and where the southern Levant became a local blend of both.

EB I—a Transition towards Urban Societies?

Several researchers (Amiran and Gophna 1989; Esse 1989 etc.) see EB I as the formative stage in the process towards the first urban societies in the southern Levant. However, as Esse (1989:81) asserts, the formation of the city states in the southern Levant have, on a general level, received relatively little attention and are often referred to as a 'backwater' of urbanism. Indeed, there seems to be a gradual development during EB I, which crystallizes in EB II, with a growing centralized settlement pattern, and expansion within economic, administrative and cultic activities.

What's more, Hennessy (1967:86) regards the EB I as relatively short, marking a transition to established urban societies. Though he suggests that there is already sporadic trade between the southern Levant and Egypt from the Late Neolithic and Chalcolithic periods, it is during Naqada II in Egypt and the EB I that this relationship becomes clear, as seen in particular in various types of pottery (e.g. Hennessy 1967:26–32; Amiran and Gophna 1992; Brandl 1992; Gophna 1992; Oren and Yekutieli 1992). Other possible connections may be seen in the stone palettes, which are common in Lower Nubia and Egypt, and which, to a limited degree, are also found at sites in Palestine, such as Horvat Beter, Wadi Ghazeh and Jericho VII (Hennessy 1967:32). Mace-heads are also common in Lower Nubia, Egypt and the southern Levant, though there is early evidence both in central Sudan and in northern Mesopotamia. Nevertheless, taking the fan-scrapers, which are common in the southern Levant and in Maadi in the lower Nile Delta, into consideration, Hennessy (1967:33–4) argues that the lithic material does not support anything other than sporadic contact with traders and itinerant craftsmen.

At any rate, Esse (1989:84–5) suggests that there are some aspects of the chiefdom stage present in the southern Levant during EB I. This is especially based on trade with Egypt, which to a large extent, involved non-subsistence items, indicating a level of social and political organization that has at least two tiers. According to Esse (1989:85, 92), this probably indicates a mixed society, based on the presence of both sedentary agriculture and pastoralists, run by a political system which had already developed into a ranked society, with the trade in Egypt, in particular, serving as a catalyst for the rapid developments. Hanbury-Tension (1986:103), on the other hand, argues that rank and hierarchy do not fit well into the 4th millennium society of the southern Levant.

Concluding Remarks

This chapter has set the cultural and chronological stage for the next chapters for the consideration of pastoral nomadism and the introduction of metal and metallurgy to the region, which is discussed in detail in Chapters 5 and 6.

To conclude, the natural environment forms an important basis for the changes that take place in the 5th and 4th millennia in the region discussed. Rainfall, in particular, is of great importance, not only limiting agriculture but also to a large degree, determining where nomadic pastoralism may develop. Moreover, although there is some discrepancy in the terminology and chronology of the Late Neolithic, Chalcolithic and EB I with regard to the southern Levant, there seems to be a picture emerging of village-based societies with increased contacts, as well as the development of pastoral communities in the desert regions. This

seems have its basis in the Neolithic, though it increases and develops substantially during the Chalcolithic period. The Nahal Mishmar appears to be an important link in this respect due to features connected to the 'nomadic character', as well as to the hoard, underlining long distance connections already formed in the Chalcolithic period. During EB I there seems to be a dissolution of villages, as well as increased focus on pastoral nomadism, when exchange with Egypt develops rapidly.

4 The 5th and 4th Millennia BC of Northeast Africa

The discussion of the southern Levant during the 5th and 4th millennia will now be expanded to northeast Africa. However, the geographical scope is here narrower due to the nature of the archaeological material. Here the main focus is Egypt, the northern part of Sudan here referred to as Lower Nubia, as well as the adjacent desert regions to the east and west. As in Chapter 3, this chapter will set the stage or context for the discussions presented in the succeeding chapters on pastoral nomads and the introduction of metal to the region. Furthermore, this chapter is significant in the understanding of cultural change over larger areas on a comparative level. We touch briefly on the past and present environment, followed by an analysis of the late Neolithic of Egypt from two different perspectives: the Nile and the desert regions. The issue of early agriculture is partly connected to the development of early pastoralism in the Western Desert and will only be concisely considered. Thereafter, the Badarian will be discussed with particular emphasis on economy and interregional contacts, before turning to Lower Nubia. This is followed by an examination of the Predynastic periods of Egypt and the Nubian A-Group, which are important to the discussion of nomadic pastoralism and the introduction of metal to these regions. In this way, the stage is set for a more generalized picture of exchange and contacts developed in Chapter 7.

Present and Past Environment

The natural vegetation of the region today is the result of considerable degradation in the last 10,000 years (Wilkinson 2003:18–19). To a large degree the generalized soil pattern and geological outline correlates, though the annual rainfall also plays a significant role. The Mediterranean vegetation type is only found in isolated areas of the Nile Delta. The lower Nile system has a riverine vegetation type on the alluvial soils with aquatic grasses, lotus, papyrus and reeds. The Western Desert is characterized by plateaux and escarpments with large-scale depressions and a vast sea of sand, dominated by linear dunes being essentially a gravel and sand desert, while the Eastern Desert is a rugged mountainous region dissected by

wadis and being essentially a rock desert (Anderson 2000:27). The modern sand seas have accumulated with climatic and eustatic changes controlling the patterns of sedimentation (Lancaster 1992). An important factor for habitation in the present, as in the past, is the availability of fresh water and springs. These have given good opportunities for village life and agriculture based on irrigation, particularly along the Nile. Today, only a small part of the Nile Delta is within the 250 mm isohyet (see Fig.3.1), which means that the remaining part of Egypt and Nubia, including the Nile Valley, do not have enough rainfall to practise what is usually defined by the misleading term 'dry-farming'.

During the Neolithic wet phase things would have been somewhat different. The Mediterranean winter rain probably shifted southwards, possibly as far south as latitude 25° N, and may in fact have interfaced with the tropical monsoon belt which moved northwards at the same time, possibly creating a 'climatic optimum' around *ca.* 5000–4000 BC (Haynes 1987; Neumann 1993; McDonald 1998; Wilkinson 2003). However, it is questionable how much annual rain this interface received and Neumann (1993) estimates it never exceeded 100 mm. During the Neolithic wet phase, the Saharan lakes at Adrar Bous, Chad and Tibesti had high levels of water. The vegetation zones were 300-400 km further north than today and in western Sudan the rainfall belts were 100 km further north than today (Muzzolini 1992). While the increase in the amount of rainfall was probably low, it was sufficient to attract larger herds of animals. On the other hand, it is doubtful if this had any real impact on the food production connected with plants, other than those connected to millet and sorghum, an issue which will be discussed further below. The wetter phase starting around 5000 BC was not as wet as the preceding phase, due to the increase in the quantity of rain. In all, this shows a climatic shift, gradually getting drier in the late fourth and third millennia BC (Hoffman *et al.* 1986; Wilkinson 2003:21).

At present, only the southeastern part of the Red Sea Hills can support herds of cattle, while the regions further to the north are inhabited by camel-herding Bedouins. In the Neolithic wet phase, the northern part of the Red Sea Hills may have resembled present-day Palestine (Trigger 1965:26). Trigger further argues that the disappearance of elephants, giraffes, and ostriches by dynastic times indicates a sharp decline in rainfall in this area by 3100 BC. Van Zeist and Bottema (1991:128, with reference to Ritchie *et al.* 1985) point out that in the Oyo depression in northwest Sudan, there was a relatively deep permanent lake between 6500 and 4000 BC surrounded by deciduous savannah. After 4000 BC it became progressively shallower and the vegetation was replaced by desert shrub grassland. When it finally dried out around 2500 BC, the vegetation disappeared from the area, except in oases and wadis. This evidence corroborates with evidence from other buried lakes in northwest Sudan. The evidence of savannah-type vegetation in the eastern Sahara (western Egypt and northwest Sudan) is supported by studies of charcoal from prehistoric sites. Van Zeist and Bottema (1991:130) argue that; 'On the basis of charcoal identifications Neumann (1989, fig. 37) postulates an early Holocene (7000–6500 BP) *Acacia-Commiphora* semi-desert (*Acacia* desert-shrub) belt between 22 and 20 N (just south of the present border between Egypt and Sudan), southward succeeded by a thorn-savannah belt'. Around 3700 BC this vegetation zone has moved 100-200 km southwards (van Zeist and Bottema 1991:130). The evidence from the Gilf Kebir Plateau in southwest Egypt is different from northern Sudan and points towards a more arid climate during the same period (van Zeist and Bottema 1991:130). This may indicate larger regional differences because humidity did not fluctuate uniformly over the whole of northeast Africa.

More recently Hassan (1997, 2000, 2002) argued that climatic changes on a global level (cf. Street-Perrot and Perrot 1990; Gasse and van Campo 1994) also had an impact on the African continent. This is connected both to short-term fluctuations such as the 6200 BC event and the long-term trend of the weakening of the monsoon system after *ca.* 4000 BC and the changes in the intertropical convergence zone. Recent review of radiocarbon dates and sites from the eastern Sahara clearly supports this picture (cf. Kuper and Kröpelin 2006). Hassan argues that there were also cultural responses to these climatic changes, and a series of short-term arid intervals may have triggered pastoralism.

During the Neolithic and Predynastic periods, the edge of the floodplain shifted due to variations in the discharge from the Nile (cf. Butzer 1976; Hassan 1986). Butzer and Hansen (1968:403) argue that wadi discharge in Egypt and Nubia was more significant during much of the period between 15000 and 3000 BC, except for three major dry interludes centred at approximately 9500 BC, 5500 BC and 4500 BC. According to Butzer (1976:13) there was frequent gentle rain, which allowed the development of a reddish soil in the Egyptian deserts around 5000 BC. In contrast, during the 4th millennium, there were occasionally heavy rains, which promoted strong surface run-off and resulted in extensive erosion. Butzer suggests the Faiyum alternating lake may be a good indicator of the Nile floods. He suggests that the floods were relatively low at *ca.* 6000–5000 BC, high between approx. 5000–3700 BC and then, again, temporarily lower, with a major episode of high floods culminating about 3000 BC. Butzer therefore argues that the prevailing climate was moister during the Predynastic and Early Dynastic periods. A diverse and rich fauna along the Nile Valley and the Red Sea Hills supports this. Hassan (1988), among others, has reconstructed the fluctuations of the lake levels from the early Holocene to the Ptolemaic period, which indicates a reduction in the Nile discharge around 3800 BC coinciding with the early Naqada sites in the Naqada region (Hassan 1988:146). He suggests the cultural transformation witnessed in the Nile Valley began as a response to the unfavourable climatic conditions in northeast Africa by the end of the Early Holocene. Consistent with Hassan, these changes set in motion larger events such as migration, change of subsistence and increasingly sedentary lifestyles.

The Late Neolithic in Egypt and Nubia—the 5th Millennium

Agriculture developed relatively late in the Nile Valley of Egypt and in other parts of northeast Africa. It occurred first in the northern part of Egypt probably after 5550 BC (Wenke 1989:136; Bard 1994:265) and about a millennium later in southern Egypt (Wetterstrom 1993). Farming in northeast Africa was probably introduced from Asia. Early evidence of food production in the Western Desert has also been suggested, but must be seen in part as a different development from that of the Nile Valley (Fig. 4.1). This will be discussed further below. The developments in the Western Desert were also probably related to changes in the economic basis occurring further south.

Bard (1994:267), following Hassan (1986, 1988), suggests that in the late 5th millennium BC, there was a need to adopt agriculture in Egypt as part of the subsistence base. This was possibly due to increasing populations of hunter-gatherers settling in the Nile Valley and growing competition over decreasing resources because of the more arid climate. According to Hassan, the Nile Valley then became a melting pot of 'desert herders', part-time cultivators

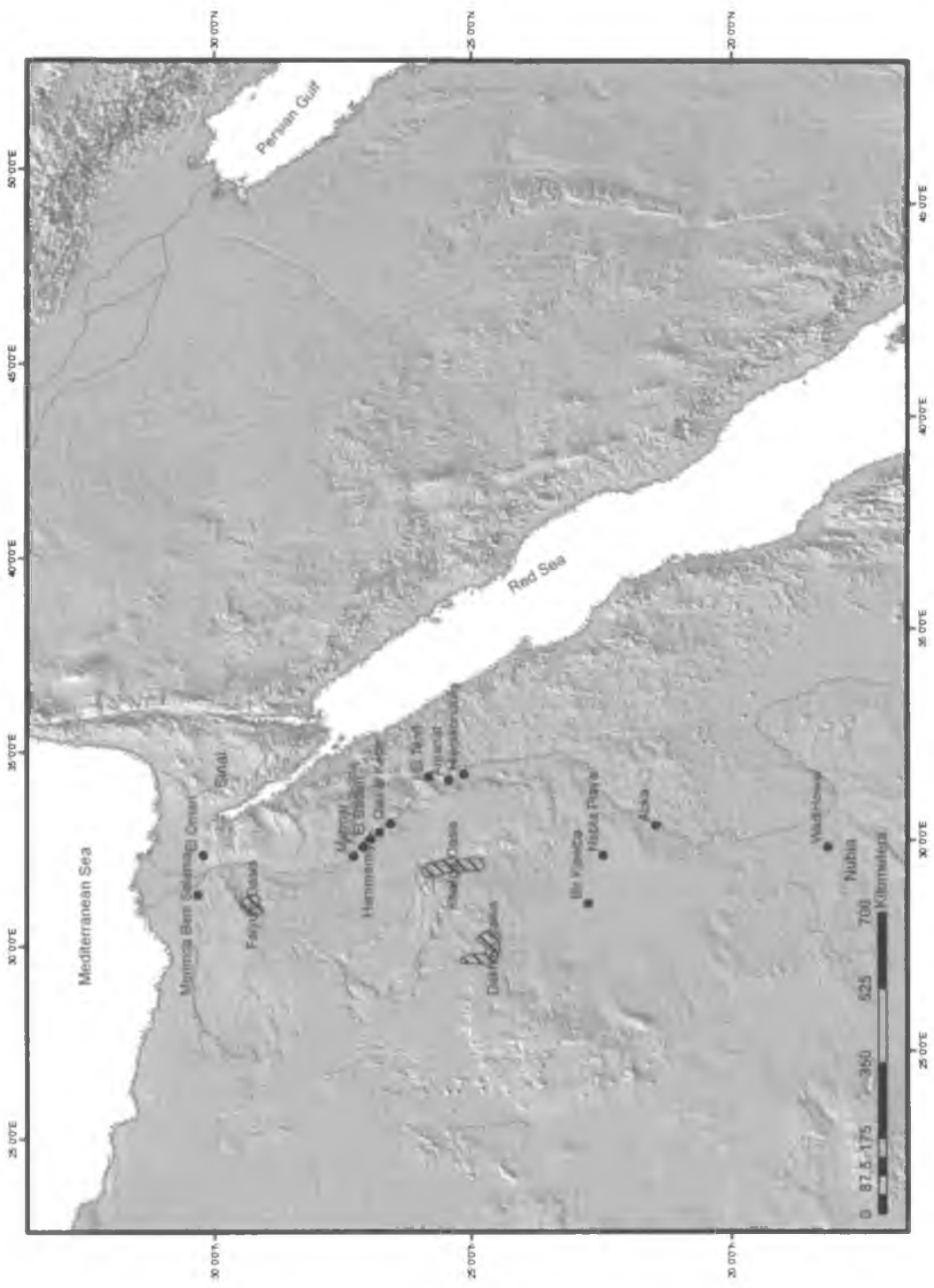


Figure 4.1 Major Neolithic and Badarian sites in Egypt.

and hunters. During the 5th and 4th millennia, there was a slow but gradual development towards intensified agriculture and settled societies, which eventually led to the accumulation of wealth and greater social differences.

Pastoralism and Food Production of the Western Desert of Egypt

To be sure, the issue of early agriculture and pastoralism in northeastern Africa is a very complex matter. On the subject of cattle, di Lernia (2004:53) argues, 'This is probably the most long-standing (and time-consuming) debate of the recent history of Saharan and African studies'. Of significant interest here are the numerous sites in the Western Desert, particularly the sites at Bir Kiseiba and Nabta Playa, which have been used to support the hypothesis of early agriculture and the domestication of cattle (cf. Hassan 1986:68–9). Further investigations of the Dakhleh Oasis (cf. McDonald 1998) and numerous fireplaces in Sahara (cf. Gabriel 1987) have given rise to much discussion on the issue.

Now within a hyper-arid environment located 100 km west of Abu Simbel, Nabta Playa in the Western Desert has revealed early evidence of possible domestic cattle, early pottery and the introduction of caprovids from southwest Asia between 6400 and 6000 BC (Wendorf and Schild 1998:97–8). The size of the Nabta Playa drainage system has probably made the area unusually attractive for a long period of time. This was particularly the case when the summer monsoons from tropical Africa moved north, as far as southern Egypt, about 12,000 years ago (Wendorf and Schild 1998:99). Although precipitation remained seasonal and limited, this caused seasonal lakes and ponds and this period lasted about 5000 years, until 5900 BP (approx. 4800–4700 BC). Consistent with Wendorf and Schild (1998:99), both animal and plant remains indicate that most of the rain fell during the summer months. However, what is significant is that this precipitation made it possible to support mobile populations in the region, with a probable combination of pastoralism, hunting and gathering. The Late Neolithic period (7500–6200 BP/5400–4200 BC) started with an episodic aridity lasting for about 100 years. This led to a reoccupation of the larger sites for only shorter periods of time, which suggests increased regional instability (Wendorf and Schild 1998:107–8). The pottery recovered has similarities to Badarian and Abkan along the Nile, which are dated between 7200 and 6200 BP (*ca.* 5300–4300 BC) (Wendorf and Schild 1998:108). Along the western edge of the largest wadi entering Nabta Palya, a significant discovery was a small stone-covered tumuli containing cattle remains. This has been interpreted as a ceremonial centre, indicating a 'cattle cult' dated to the beginning of the Late Neolithic wet interval, around 5500–5300 BC. This may suggest that groups have aggregated near a few water sources during periods of drought (Wendorf and Schild 1998:108–9).

In line with Wendorf and Schild (1998:105–6), domestic sheep and/or goat were introduced to Nabta Playa around 6000 BP (*ca.* 4100 BC), probably from southwest Asia via the Nile Valley, replacing wild animals as a source of meat in the succeeding periods. No plant material has been recovered, from the period defined as Middle Neolithic (6300–5600 BC), but storage pits and grinding stones are numerous, indicating the processing of food and its subsequent storage. However, there are no traces of wheat or barley, although it is expected to have been introduced from southwest Asia at about the same time (Wendorf and Schild 1998:106). Wendorf and Schild (1998:106) suggest that larger groups aggregated during the wet seasons, while in the drier seasons they dispersed into smaller herding camps (Wendorf and Schild 1998:106). They argue that Nabta Playa may have emerged as a regional ceremonial

centre and it is possible that political systems were present as early as *ca.* 8000 BP (*ca.* 6100 BC), due to the existence of large settlements and the increase in cattle remains, reaching a peak in the Late Neolithic with a trend towards social complexity. Not only may the Saharan pastoralists have provided an external differentiation stimulating social complexity in Egypt, but they may also have been a contact point between Nilotic groups, already possessing an agricultural economy and cattle pastoralists in the Western Desert (Wendorf and Schild 1998:114). In other words, the symbiosis between these different groups and economies stimulates complexity. Yet, an important issue beyond the scope of this text is whether or not the cattle bones at Nabta Playa are actually domestic cattle (cf. di Lernia 2004:53–4).

The evidence of early food production from Nabta Playa has been much discussed, but the evidence represents only three barley grains and an inflorescence of wheat (cf. Stemler and Falk 1980). Wetterstrom (1993:200) regards the evidence as suspect and not convincing. More recently, Wendorf and Schild (1998:106) state clearly that no wheat or barley connected to early food production has been found at the Nabta Playa sites. Wetterstrom (1993:200) also doubts whether wheat or barley could have survived the climate of southwestern Egypt. Of greatest significance is the situation whereby the cultivation of wheat and barley at these sites would have demanded a change of the planting season in order to fit with the seasonal rains. This is because in the Mediterranean, wheat and barley are normally planted in the cooler winter months and would require rain or moisture at a time when the region of southwestern Egypt was drying up (Wetterstrom 1993:200). Therefore, Wetterstrom (1993:200) suggests that the only possibility of farming such crops would be the planting of summer crops, such as sorghum and millet, and this fits well with the evidence of sorghum at Nabta Playa (Wendorf and Schild 1998). This does not exclude the possibility of farming, but the appearance of caprovids in northeast Africa did not include the full 'package' found in the Levant with crops such as wheat and barley. Hence, Wetterstrom (1993:201) suggests that food production was established between 6000 and 5000 BC in Egypt, as this was the time when the complexities of food and livestock production were fully developed in the Levant. Anything earlier would be difficult to postulate, as sheep and six-row barley have not been found in Sinai so far. Additionally, she argues there is no evidence of domesticates in Fayum and Upper Egypt before 6000 BC. Thus, the introduction of food production (at least for the production of plants) is not necessarily late, but must be considered within a greater cultural context. This would fit roughly with the development of mixed-farming societies between 5000 and 4000 BC in both Egypt and Nubia. On the one hand, the introduction of wheat and barley would be possible along the Nile using the alluvial plains of the river. This would not demand a major genetic change in the growing season because the crops could still be planted in October or November after the September floods. On the other hand, irrigation or a genetic change was needed for wheat and barley in areas south of the winter rain in order to survive (cf. Sherratt 1980). These grains could not thrive in the arid environment to the west, as they would only have the tropical monsoon rain for moisture. This then implies a development from the initial cultivation based on fixed-plot horticulture in the Levant, to surface-water horticulture and channel irrigation along the Nile (cf. Sherratt 1980:fig.1 and 2). In sum, it might appear as if there are two different traditions meeting in Egypt: a Levantine complex based on sheep/goat and barley (and wheat), introduced to the region around 6000 BC, and a northeast African complex based on cattle pastoralism, and possibly sorghum and millet. The next chapter will delve into these issues in greater detail.

The investigations of the Dakhleh Oasis in south central Egypt are similar to the evidence from Nabta Playa. Relatively sedentary groups are also found here around 6000 BC, utilizing a broad spectrum of resources, but with no evidence of food production. Herding seems to appear around 5000 BC, with an increased focus on aggregation after 4500 BC, coinciding with increased aridity (McDonald 1998). However, the evidence does not shed light on the development of pastoralism. It appears to have a distinctively African character and, in this early phase of pastoralism, is less tied to agricultural societies than the Levant (McDonald 1998:137). This indicates a form of pastoral nomadism, based on hunting and gathering plants, as evidenced by the grinding equipment. McDonald (1998:137) argues that animals may have been used for milk, blood and transport from the beginning, although there are no real indications of milk being used at this stage. This is an issue to be returned to in the next chapter. Early pastoralism in northeast Africa must have had a different character and basis.

In considering both the growing social complexity and interregional contacts, evidence in the form of circular concentrations of stone and pebbles from large parts of the eastern Sahara are significant. Gabriel's work (1987) on dating fireplaces in the Sahara is of consequence, as it shows the greatest activity around 3800 to 3000 BC, and he attributes these fireplaces to Neolithic cattle herders. More recently, as part of a multidisciplinary research programme, the Germans have surveyed and excavated sites in this region of northeast Africa, from the Qattara-Siwa depression in the north to Wadi Howar in the south (e.g. Kuper 1986; Keding 1998; Lange 2000; Schuck 2002). The density of sites between 7000 and 4000 BC, with a hiatus between 5500 and 5000 BC corresponds fairly well with the arid phase. This may in fact support Hassan's (1986) theory that increased desertification motivated an eastward movement from the delta and central Sudan into the Nile Valley, with the appearance of 'Neolithic' sites. Although the region is desert today, it shows that it has been well used during prehistoric periods, especially in the late Neolithic periods (cf. Kuper and Kröpelin 2006). As well, there are traces of lithic material, pottery and domesticated animals, together with rock paintings and carvings. Muzzolini (1986) has suggested that the paintings and carvings were the creations of Neolithic pastorialists, by reason of the depiction of both wild and apparently domesticated fauna. This might be seen in connection with the humid Neolithic starting in the first half of the 5th millennium BC, which made it possible for pastoral groups to utilize and spread out through this environment. These issues will be followed up in the chapter on pastoral nomads, but there can be no doubt that this led to both social changes, as well as increased contacts over large areas, including the more arid regions.

Changing Subsistence, Increased Sedentism and Agriculture along the Nile

As outlined, there is relatively early evidence of at least experimental domestication and agriculture both in southern Egypt and in the Western Desert (Bard 1994:265–6, with reference to Wendorf and Schild 1980). There is also an early presence of domesticated sheep and goat in both the Eastern and Western Deserts from about 5900 BC (Vermeersch *et al.* 1994), while in the Nile Valley it seems to be documented several centuries later. However, relatively few sites are known from this early phase of introduction of agriculture and animal husbandry. On a comparative level, the sites in the Nile Valley are contemporary with the Late Neolithic-Chalcolithic sites in the Levant.

During the Late Neolithic in the Nile Valley, there are several sites which point in direction of increased sedentism, although the picture is not at all clear. One such site is El-Tarif close to

Luxor which seems to represent an occupational layer probably dating to the 5th millennium BC (Ginter and Kozlowski 1984). El-Tarif seems to be a transitional stage between the late epipaleolithic or early Neolithic and the later Naqada groups in the region (Bard 1994:267). However, Wetterstrom (1993:191) considers the site to be epipaleolithic, as there is no evidence of food production, and the only date (5285 ± 120 BC, Hassan 1988:143) is about a thousand years older than any of the known farming communities in Upper Egypt. El-Tarif had pottery, although there is no evidence of agriculture or animal breeding. No habitation structures have been found (Hendrickx and Vermeersch 2000:36). It is difficult to ascribe the site to a larger cultural setting or suggest what type of social organization it represents, but in a long-term perspective, it may represent a gradual process of increased food production.

The Fayum Oasis to the west of the Nile has attracted both humans and animals for millennia owing to the ancient lake that once was found there. Consistent with Caton-Thompson and Gardner (1934) who first excavated the settling-in huts or shelters with hearths, the cultivation of emmer wheat and barley with large underground granaries is evidence of an agricultural society. Hassan (1988:148) has suggested that the dwellings were wigwams or wickiups of rounded or oval shape, similar to the structures still used among the Ababda in the Eastern Desert. He suggests a settlement pattern between full sedentary and nomadic herders or hunter-gatherers for the people who lived in Fayum (Hassan 1988:149). Fayum has, according to Hendrickx and Vermeersch (2000:37), been dated between 5450 BC and *ca.* 4400 BC, while Hassan (1985:106) suggests that the Fayum site spans from about 5250 BC to about 4000 BC. It is probable that agriculture, as well as animal husbandry and fishing, were important factors in the subsistence, but there is no evidence of larger social differentiation, as graves are lacking. However, the site must be understood in a context of growing sedentism due to the rich diversity the environment offered, as well as increased reliance on agriculture and animal husbandry—laying the economic foundation for the millennia to come.

To the north of Fayum in the upper part of the Nile Delta, Merimda (Beni Salama) is more or less contemporary with Fayum. In line with Hassan (1985:105), the site was occupied between *ca.* 4800 and 4400 BC and likely later. The site illustrates a gradual increase in complexity and a denser settlement. The crucial aspect of this site is that already in its first phase, domesticated species of sheep, cattle, pig, goat and dog have been recovered. Hendrickx and Vermeersch (2000:37) suggest that the economy was possibly a mixture of fishing and hunting, as well as agriculture and animal husbandry. During the second phase, the economic subsistence seems to be agriculture and animal husbandry, which seems to become more important due to the increase in cattle bones, although fishing and hunting is still attested (Hendrickx and Vermeersch 2000:38). During the third phase, Merimda develops into a series of mud dwellings, huts and workspaces, often with well-arranged, oval houses along narrow streets and pathways. There are individual granaries, as well as reed enclosure fences, possibly used for livestock. It gives the impression of a village-like society (Hendrickx and Vermeersch 2000:38). The most recent excavations have recovered postholes of small oval houses from all the phases, in addition to numerous fishing implements and storage pits (Eiwanger 1982:67–80). At Merimda, burials seem to follow the general pattern of northeast Africa and the Middle East, with burials in the floors of houses or adjacent to the living areas without any clear evidence of social ranking (Wenke 1989:137). There are a number of similarities to the sites that we also find in the Late Neolithic and Early Chalcolithic of the southern Levant.

Located just south of Cairo, El-Omari is partly contemporary with the later phases of Merimda, but here, settlements and cemeteries are separated (Hendrickx and Vermeersch 2000:39). The site has been dated between 4600 and 4400 BC, although it is uncertain to what degree this covers the entire occupation of the site (Midant-Reynes 2000a: 124). According to Hassan (1985:105), there is only one radiocarbon date from the site, giving the second half of the 5th millennium, depending on the correction table used. Here, pits for storage and dumping of refuse have been found, while structures connected with habitation might have been very light. At El-Omari, agriculture and animal husbandry (sheep/goat, cattle and pig), along with fishing, seem to be the dominant mode of subsistence (Hendrickx and Vermeersch 2000:39). The use of domesticated donkeys is represented in the bone material from the site (Midant-Reynes 2000a:124). Several types of wheat, as well as barley, rye, legumes and flax have also been utilized.

It is becoming clear that during the 5th millennium BC, there are no signs of social inequality. This does not mean that there were no social differences, but they were at any rate not reflected in the archaeological material and are not as evident as in some of the Badarian material mentioned below. Yet, during large parts of the 5th millennium, there seems to be a period when there was a number of changes connected to both agriculture and increased settlement density, as seen, for example, in the last phases of Merimda. These changes are also reflected in the archaeological material exemplified by clay animal figurines, which are connected to the growing dependency on agriculture, as well as products of domesticated animals. Most important here is that wheat, barley and sheep/goat are present as part of the Levantine complex being introduced into the Nile Valley.

Growing Social Inequality along the Nile—the Badarian

The Badarian was first identified at El-Badari in Upper Egypt and many small sites have been found near Qau el Kebir, Hammamiya, Mostagedda and Matmar. These consist of more than 600 graves with by and large good preservation and 40 poorly documented settlements (Hendrickx and Vermeersch 2000:39). Similar artefacts have also been found at Armant, Hierakonpolis and in Wadi Hammamat (Midant-Reynes 2000a:152). The very beginning of this cultural phase is not certain, but it is definitely attested in the period 4400 to 4000 BC at Hemamieh (Hassan 1985:107), generally preceding the Naqada.

The majority of information on the Badarian comes from cemeteries in the low desert. Significantly, the Badarian graves are relatively 'wealthy' compared to other contemporary and earlier graves. The material seems to reflect an increasingly structured and complex society, which accelerated enormously throughout the 4th millennium BC (Midant-Reynes 2000a:152). The wealthier graves seem to be located in one part of the cemetery and are interpreted as an early indication of social stratification, which became increasingly important throughout the subsequent periods (Hendrickx and Vermeersch 2000:40). Bone and ivory artefacts have been found in both graves and settlements, in addition to stone palettes, sometimes bearing the stains of ochre or malachite (Midant-Reynes 2000a:154–5). Sickle blades, as well as grains, identified as castor oil plant, rye, wheat and barley broaden this picture. Copper artefacts now appear for the first time, though in very limited numbers (see also Chapter 6).

The settlements are rather unclear and Wenke (1989:137) describes them as insubstantial clusters of pole-thatched constructions associated with hearths and silos. Alternatively, Hassan (1988:153–4) suggests that they were collections of flimsily built huts and windbreaks

associated with hearths and silos, reflecting short-term occupations. He also argues that there is evidence of animal enclosures, indicating that herding became subsidiary to agriculture (Hassan 1988:155). At Mostagedda, Brunton (1937) excavated a semi-subterranean house, which contained a hearth and a millstone. The material suggests that they had an agro-pastoral adaptation, combined with hunting and fishing. This may indicate a relatively mobile existence based on the annual flood cycle, agriculture, pastoral and hunting activities. Near Asyut, the sites seem to have an economic basis of domesticated cattle and small livestock, hunting, fishing, cereals and wild plants (Sadr 1991, with references). Situated in both the alluvial zone and the bordering terraces, they may have practised different seasonal subsistence activities. It is in fact possible that there were several modes of subsistence existing side-by-side during the Late Neolithic period of Egypt.

Increased Contacts?

Hendrickx and Vermeersch (2000:37) suggest that there are indirect links to distant places from the material recovered at Fayum, including seashells from both the Mediterranean and Red Seas, cosmetic palettes of Nubian diorite and green feldspar beads. Jewellery is represented by pierced shells from the Red Sea, in addition to bone and stone beads (Midant-Reynes 2000a:121). It is noteworthy that no copper or malachite has been found at Fayum, but the contours of a wider spectre of contacts exist, although these are not numerous neither clear. One may also question if the Neolithic people at Fayum obtained these things themselves, or if this represents part of a wider informal network.

A few copper objects have also been found in Badarian graves and Midant-Reynes (2000a:160) suggests that the Eastern Desert is the most likely region to be first exploited. On the basis of the turquoise extraction at Serabit el-Khadim (Beit-Arieh 1980), Midant-Reynes proposes that groups from Palestine, based in Sinai, obtained, polished and provided Egypt with turquoise. At Abu Matar in the southern Levant, seashells from the Red Sea have also been found, along with turquoise from the Sinai and fresh-water snails from the Nile Valley (Midant-Reynes 2000a:161). Badarian contacts with neighbouring regions created a dynamic, but also demanding, culture of expressing status through objects made of turquoise, copper, steatite and seashells from distant places.

Thus, the material shows without a doubt, that there existed increased contacts over vast areas, though the nature of these is still unclear. Although interregional contacts are limited, there are good indications of contact with the Red Sea, particularly with regard to the shells attested in graves. These issues will be pursued in Chapters 5, 6 and 7.

Lower Nubia

The later Stone Age sites of Lower Nubia are represented by a relatively clear economic shift—a shift towards a broader spectrum of subsistence activities, including gathering and grinding cereals, hunting and fishing, which eventually led to a gradual development of food production (cf. Haaland 1981, 1984, 1987; Krzyzaniak 1986; Reinold 1987; Caneva 1988). Food production and other forms of subsistence, such as pastoralism, are in any case acknowledged and established, but there appears to be a different economic base further south. In Lower Nubia, interaction and cultural transformation increases at a steady pace in pottery producing groups, such as the Khartoum Variant, Post-Shamarkian, Karamakol Group and Abkan (cf. Haaland 1972; Nordstöm 1972; Sadr 1991).

The Khartoum Variant settlement pattern is characterized by relatively small, homogeneous sites, possibly camps of small bands or nuclear families (Nordström 1972:10). Most of the sites are located on deflated alluvial hills and slopes, along the river terrain, but there are also sites in what is now desert environment (Shiner 1968:780ff), which must have been previously located in the vicinity of water resources. These sites indicate earlier emphasis on hunting, gathering and fishing, and people continued to live on these sites after the introduction of domesticated animals. The semi-sedentary life continued, though, with a different economic basis (Sadr 1991:84). Grinding implements found do not necessarily imply agriculture, but may be connected to other aspects of food preparation or the manufacture of pigments. Faunal remains point to the utilization of aquatic resources, in addition to ostrich eggshells, although Nordström (1972:10) suggests that hunting also played an important role, possibly with groups moving seasonally between different ecological environments. Sadr (1991:82), on the other hand, suggests that the Khartoum Variant corresponds to a mixed economy adaptation, possibly without any domesticated plants or animals.

No structural remains have been found at the habitation areas of the Post-Shamarkian and the Karamakol Groups, except a few simple fireplaces (Nordström 1972:8). There is an absence of faunal material, but a high proportion of imported tools of Egyptian flint was recovered. According to Nordström (1972:8), these sites are much larger than the earlier Shamarkian sites, which may reflect an economic shift, although there is no evidence of agriculture, fishing, or domesticated animals. Nordström (1972:8) has therefore suggested that the site DIW-50, in any case, may reflect specialized activities, perhaps trade or exchange, due to the high proportion of imported Egyptian flint. Sadr (1991:83) sees the post-Shamarkian and the Karamakol Groups as separate regional groups, suggesting a mixed economy population, rather than any of the other types of pastoral adaptation. Two radiocarbon dates from the post-Shamarkian sites have given the latter half of the 5th millennium BC (Hassan 1986).

The Abkan have a relatively long tradition in Nubia and consistent with Nordström (1972:14–15), there are no structural features in terms of walls or foundations known from the Abkan sites. Remains include scattered hearths and pieces of burnt clay, which may have originated from walls or ovens. On the basis of the settlement patterns, Nordström proposes that the sites, consisting of both small camps and extensive habitations, may reflect a more complex subsistence than identified from the Khartoum Variant, although agriculture is not clearly indicated in either group. The faunal material points in a different direction, implying more similarities with the earlier and contemporary Khartoum Neolithic to the south, which had a strong emphasis on aquatic resources (cf. Haaland 1987). Fish bones are common on many of the major Abkan sites, although there is no evidence of fishing implements (Nordström 1972:15). Shiner (1968:627) has argued that hunting declined during this period, as animal bones and points are less frequent than in the preceding period. At one site (AS 6-G-25), a variety of bones were found, such as Nubian wild ass, hare, ostrich eggshell, gazelle and large bovid—probably *Bos primigenius*, in addition to the small domestic goat from an uncertain context (Nordström 1972:16). Consequently, Nordström (1972:16) argues that wild game still played a role, though maybe less than previously, because domesticated animals may have formed a subsidiary part of the economy and subsistence. Sadr (1991:82) also proposes a mixed economy population based on hunting, fishing and gathering because the sites are located in areas suitable for trapping fish, there is scarce evidence of domesticated plants and animals, and there is a likelihood of seasonal mobility due to the wide range of site size.

In Egypt and Lower Nubia, changes in the subsistence pattern and the manner in which the local environment was exploited (see Sadr 1991:fig. 6.2) were probably connected to a wider range of growing interactions over larger areas, to pastoralism and to increased aridity. This establishes the economic basis for the significant developments of the 4th millennium, in particular, the Naqada, Maadi and Nubian A-Group, which will be discussed below and in succeeding chapters, regarding pastoralism and copper.

The Predynastic Periods of Egypt: Naqada and Maadi the 4th Millennium

Hassan (1988) suggests that the 4th millennium was the era in which Egyptian society was forged and its identity developed. This was based on the theory that desertification, both to the east and west of the Nile, created a melting pot of herders and cultivators in the Nile Valley. Bard (1994) proposes that two different Predynastic cultures developed in Egypt, both practising agriculture: the Naqada in the south and the Maadi/Buto in the north. During this period, the population of Egypt became almost completely reliant on agriculture and herding (Trigger 1983:68), though Chapter 7 will question whether products, such as milk and wool, were in fact utilized.

Dating, Periods and Sites

The dating system of Predynastic Egypt was developed by Petrie in the spirit of typological and evolutionary development, in a seriation system based on pottery from graves. Here, the pottery was given a Sequence Dating (SD) number based on the form and decoration of the vessels found in the burial sites. Starting on SD 30, he left room for new and earlier discoveries to come, with the implication of a high SD referring to a younger age and a low SD referring to an older age. Petrie identified and labelled three different periods (Amratian, Gerzean and Semainean) in a system which has been modified several times, especially by Kaiser (1957), giving the periods new labels and partially new SD numbers (see Fig. 4.2). There have been some minor changes and improvements, but the relative outline has been kept and it is still important for the dating of the Predynastic periods of Egypt. The fundamental basis for the Sequence Dating system lies in the gradual development and evolution of pottery forms from an internal point of view, but little attention is placed on possible external influences.

Petrie	*Kaiser*
Amratian = SD 30-39	Naqada I = SD 30-38
Gerzean = SD 40-52	Naqada IIa,b = SD 38/40-45
	Naqada IIc,d = SD 40/45-63
Semainean = SD 54-79	Naqada III = SD 63-80

Figure 4.2 Sequence Dating of the upper Egyptian Predynastic (after Bard 1994:269, Table 1).

One of the major drawbacks of the system is that it is based entirely on burial remains, as settlement remains are still extremely scarce. There is little evidence of Naqada I houses, with the exception of a probable wind-break from Mahasna, clay hut circles at Hemamieh and a clay model fortress from Doispolis Prava. At Hierakonpolis, there is evidence of rectangular

partly subterranean dwellings, which have been plastered with a mixture of mud and dung (Hoffman 1982:fig. VI.4). Kom el Ahamar is one of the few settlement sites covering the transition between Naqada I and II, but it was abandoned relatively early in Naqada II (see Fig. 4.3). Here, there were traces of partly sunken structures, perhaps both used for storage, as well as dwellings similar to those found at Hemamieh, Badari and Abydos (Needler 1984:114). At sites like Hemamieh, the Badarian material is followed stratigraphically by the Naqada I material (Brunton and Caton-Thompson 1928). The patchiness of known sites may be due to the building materials used, such as wood and mud, as well as their locations along the Nile and later on in agricultural areas. Generally speaking, there is not much evidence of settlements in the Predynastic period, though this may be a result of excavation priorities having focused more on graves, ignoring the settlements that may be below the floodplain, or relatively deep below other sites.

Burials, Pottery and Metal

The Naqada I period was more complex than the Badarian period, although they had many similarities in burial forms (Midant-Reynes 2000a:170). The burials identified from Naqada I at Hierakonpolis have been suggested to represent powerful individuals, on the basis of form and size (Midant-Reynes 2000b:47). However, increasing hierarchization is not particularly evident during Naqada I. There seems to be a greater social diversity and variation, which, in the succeeding Naqada II and III, has a more obvious hierarchal development with extremely rich burials. Hoffman (1982) notes a gradual change in burial practices where wrapping the dead in animal skin dies out and wooden coffins begin to appear. In addition, copper and stone vessels in alabaster now appear as part of the funerary gifts. Copper was used to make small tools, like pins, but was not yet smelted (Trigger 1965:60). There is not much difference in the metalwork recovered from the preceding Badarian period. Finds remain small and very rare in the Naqada I period (see also Chapter 6).

The graves of the Naqada II period are richer and bigger. It is possible that the first states emerge during this period (cf. the tombs at Hierakonpolis). Cast metal is not common, but adzes and daggers do appear (see Chapter 6). Increased social differentiation in graves seems to develop considerably. There seems to be a significant social development after 3500 BC, which is linked to the Naqada II period. Fattovitch (1997a) has interpreted this as a chiefdom society, while others refer to it as a state society. There are major changes in the burial rituals, with greater emphasis on wealth deposited in the graves, as well as an increase in the size of the graves, of which Cemetery T at Naqada and Tomb 100 at Hierakonpolis are good examples (Midant-Reynes 2000b:53). The same processes are seen at Abydos where burials also increase in size and wealth. During Naqada II, three centres seem to have developed synchronously: Naqada, Hierakonpolis and Abydos, all of which have exceptional cemeteries and large residential areas, such as Naqada South Town's large rectangular mud-brick structure and enclosure wall. Except for this, there is not much evidence of the Naqada II settlements, although the clay house models found at el-Amra and Abadiya are much referred to as models for dwellings.

Adaptation and Economy

Due to the lack of settlement sites, there is not much data on the economy and adaptation. However, some of the burials have revealed evidence of domesticated animals, such as goats,

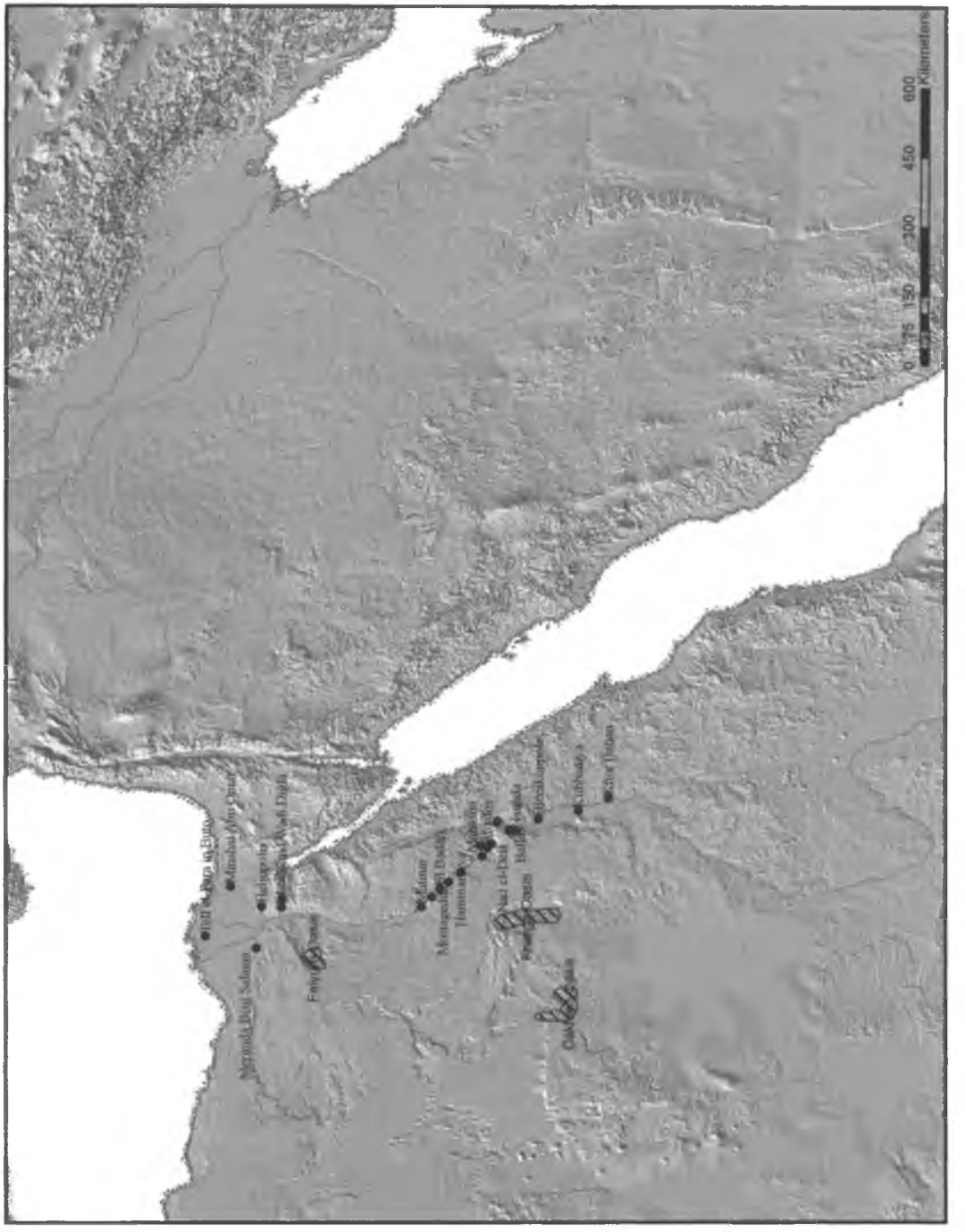


Figure 4.3 Major sites of Naqada I, Naqada II and Maadi.

sheep, bovids and pigs, either in the form of bones or clay models. There is also evidence of wild animals and fish. It is likely there was also wheat, barley, peas, tares and fruits. The Naqada I economy was possibly based on agriculture and cattle, with hunting and fishing still important. During Naqada I, there is a strong emphasis on riverine fauna, although other animals are also represented. Bard (1994:267) indicates that the origin of Naqada is probably to be found among the local hunter-gatherer and fishing groups living along the Nile, merging slowly with cattle pastoralists that were forced into the valley by increasing aridity. This may have forced pastoralists from the east and west into the Nile Valley, creating a large pressure on the existing resources. According to Sadr (1991:86, see also his fig. 6.3), the Upper Nile Valley appears to turn to more specialized agropastoral production after 4000 BC. Large sites, such as Armant and Hierakonpolis, are now located at the edge of the floodplains and are interpreted as main centres due to extensive cemeteries, increased social inequality evidenced in the tombs, as well as architectural remains in terms of both rectilinear and subterranean houses. As Sadr (1991:86, with references) notes, the Hierakonpolis sites were surrounded by smaller and more specialized satellite camps, where the production of pottery, beads and stone vessels took place.

During Naqada II Hierakonpolis had a settlement near the river, where they managed to cultivate the surrounding land by simple irrigation techniques. There is evidence of wheat, barley, flax, various fruits and vegetables in addition to domesticates such as goat, sheep, and pig (Midant-Reynes 2000b:56). Krzyzaniak (1977:127ff) argues that it was during Naqada II that local artificial irrigation systems were made using small basins and canals in order to expand the cultivated areas. After 3500 BC there seems to be an increased focus on the alluvial river edge with a number of agricultural villages such as Armant, Abydos, Mashasna and the South Town at Zawaydah (Sadr 1991:87, with references). At Hierakonpolis there is a significant shift towards greater emphasis on the agricultural zone of the Nile Valley and away from the desert settlements of the earlier periods. In connection with the greater focus on the agricultural zone, there are also major changes in the burial rituals with a greater emphasis on wealth as argued above. Several sites have been interpreted as production centres and markets illustrating increased commercial complexity during the Naqada II period (see Sadr 1991:fig. 6.4). This process of increased focus on the alluvial with agricultural villages continued during Naqada III, probably also due to irrigation and increased control by the rulers (Butzer 1976).

Predynastic Contacts

Hassan (1986:157) has argued that intra-Nilotic interactions accelerated after the advent of food production. By 3800 BC, the Nile Valley was dotted with relatively large sedentary settlements from Central Sudan to the Delta, engaging in interregional exchanges increasingly facilitated by boat transport. During Naqada II, these interactions increased to involve contacts with early 'urban' communities, craft specialization and social differentiation outside the Nile Valley. According to Hassan, such contacts would also lead to dispersal of artefacts, design and ideas over large areas.

The general belief surrounding the transition from the Naqada I to the Naqada II period has been that it either reflects infiltration by a new people (Petrie 1920:5, in Arkell 1975:42), or it reflects a fundamental and abrupt change (Baumgartel 1947:38). However, there is no evidence of any invasion, or that Naqada II breaks completely with Naqada I. Rock pictures in the Eastern Desert and the dating of ships cannot be tied to an asiatic invasion at the beginning

of Naqada II. Still, it is a period of increased cultural contact both with the southern Levant and Mesopotamia (cf. Frankfort 1956; Trigger 1965; Emery 1972). Trigger (1965:61) clearly states that this is not at all surprising in view of the exchange that went on between Palestine and Egypt. Palestinian pottery appears in Egypt, and soon after, Egyptian pottery appears in Palestine. In addition, seal impressions from the Jemdet Nasr period in Mesopotamia are found in Palestine, suggesting that Palestine is the area of 'transit' (Anati 1963:354). Increasingly interregional contacts appear, especially during the Naqada II. This is not only seen in the 'Mesopotamian' motives found in Egypt, but also in the lapis lazuli, obsidian and 'Palestinian' pottery appearing in Egyptian contexts (Trigger 1983; Adams 1988; Hoffman 1991; Mark 1997). The same can be seen for copper artefacts, with an increasing focus on the accumulation of wealth and the expression of symbols of power, which will be taken up in Chapter 6 and 7 in greater detail.

Sinai was probably a source of various raw materials, such as copper, malachite and turquoise, during both Naqada I and II. The exchange contacts of Naqada II seem to have been extended to the Western and Eastern Deserts of Egypt, as well as the Nubia and the Near East (cf. Krzyzaniak 1977; Hoffman 1982; Fattovich 1997b). In general, the Naqada II period emerges as a phase of increased centralization, with elites and centres for commercial and cultural development, such as Naqada, Hierakonpolis and Abydos. It is apparent that the Naqada II sites expand into Lower Egypt, as far south as middle Lower Nubia. It is likely that the location of Naqada also stimulated increased contacts, being situated directly opposite the western end of Wadi Hammamat, which provided easy access to the Red Sea through the Eastern Desert. Similarly, Hierakonpolis came into being at the wadi mouth, connecting the routes of the Sahara desert to the oasis (Redford 1992:14, with references). These issues on contact, exchange and specialization will be discussed further in Chapter 7.

Maadi and Other Sites in the Lower Delta

A different pattern appears during the 4th millennium BC in the Nile Delta. During the later part of Naqada I and continuing into Naqada II, a number of sites with dissimilar pottery appear. By the end of Naqada II, this seems to have been overshadowed by the developments further south and the expansion of the Naqada II to the Delta. Sites with Maadi pottery have been found in an area from Buto south of Cairo, in the Fayum region and as far south as Sedment (Rizkana and Seeher 1987:63) (see also Fig. 4.3).

Maadi is located on a terrace between two wadi mouths, covering a large settlement area together with a Predynastic cemetery 1 km to the south at Wadi Digla. Part of the settlement appears to have parallels to the southern Levant and the Beersheba region with a number of subterranean houses. With the presence of hearth and silos, this points to a permanent settlement. Besides the subterranean houses, there is also evidence of huts and rectangular structures interpreted as houses. Maadi pottery seems to have similarities to the south, as well as to the Levant, though the imported Levantine pottery at Maadi counts for less than 3% (Rizkana and Seeher 1987:31–2). Midant-Reynes (2000b:58) suggests that Maadi is strategically positioned, being influenced by the Western Desert, Naqada in the south and the southern Levant in the east. There have been large circular scrapers found at Maadi which are also known in the southern Levant (Rosen 1983, 1997). Fish bones further support the evidence of fishhooks at Maadi. No axes in flint or other materials were recovered at the site (Rizkana and Seeher 1989:16).

Several have argued that Maadi represents a network of intercultural contacts not only based on the pottery from the EB I in the southern Levant, but also due to the role of copper. Copper awls, harpoons, rods, spatulas and axes have been found, in addition to copper ore, deriving from Feinan in Jordan (Hauptmann 1989). Hayes (1965:128) suggested that Maadi should be regarded as a centre for copper production, while Rizkana and Seeher (1984:239) have a more conservative view, arguing that the smelting has only been tentatively identified. Copper artefacts and its implications will be discussed at length in the next chapter on copper. The slate palettes and the disc-shaped mace-heads found at Maadi may point to Upper Egypt, but, on the other hand there seems to be a strong local pottery tradition. Seeher (1990) argues that there was a number of products coming from the southern Levant, including copper, flint, Red Sea shells, resin, oil, wood, asphalt and basalt. Evidence of the domesticated donkey at Maadi and el-Omari may well be connected to the important role Lower Egypt and the Delta played in these intercultural relations.

The subsistence at Maadi seems to be agro-pastoral, or in other words a relatively common adaptation with reference to both northeast Africa and the southern Levant. Rizkana and Seeher (1989:74–5) suggest that the economy was based on farming and herding with emphasis on sheep, goat, cattle and pig. The latter is a relatively good indicator of a settled society, although this does not exclude the possibility that part of the society was more mobile. However, large storage pits and jars, as well as grinding stones, may further support the notion of a relatively sedentary society, or possibly shifting occupation within the site (Caneva *et al.* 1989:287). There is no indication of a planned settlement, nor is there any evidence of specialization within certain areas. In the cemetery at Wadi Digla near by, more than 400 human burials and several animal burials were found, all with few or no burial goods. At Wadi Digla, no copper artefacts were found among the grave goods but there were fragments of malachite recovered. Compared with contemporary burials in Upper Egypt, the burials at Maadi are poor and lack stratification or hierarchy as seen in southern Egypt. This is striking. If these were in fact connected to interregional exchange and contact, one would expect larger social differences over time, with certain persons accumulating more power and wealth than others. A gradual tendency can be discerned as certain burials seem to be better equipped than others (Midant-Reynes 2000b:59), though not on a scale found in Upper Egypt. Another site associated with the Maadi cultural complex is the cemetery at Heliopolis (Debono and Mortensen 1988) which seems to reflect the same tendency. Links to the southern Levant were also evident here, though on a small scale. With only three ceramic objects and a basalt vessel, it certainly points in the direction of contact.

Further to the north there are several other sites associated with the Maadi cultural complex, such as Tell Ibrahim Awad, Tell el-Iswid and Tell el-Fara'in (Buto). Besides, Mishat Abu Omar has revealed Naqada pottery and has been related to the expansion of Naqada II onwards. Here, 'imported Palestinian' pottery has been found, although the amount is small and there are only selected types of pottery (Kroeper 1989). Particularly interesting are the spouted vessels indicating liquid storage and a few fragments of churns (cf. Kroeper 1989:415–16), possibly indicating pastoral products. This site has a few fragments of copper but nothing compared to Maadi, 100 km further south. Buto is, in this case, important and special as it lies in the middle of the Delta, very close to the coast. In fact, the final phase of Maadi is represented by the earliest stratigraphic layers at Buto, which consistent with Midant-Reynes (2000b:60), is equivalent to the middle of the Naqada II phase (levels II c-d).

This may be explained by the change in transportation technology. In this manner, Maadi played out its role, just as the Chalcolithic societies of the southern Levant had done a century or two earlier, while Buto (cf. von der Way 1987, 1988, 1989, 1992) became a new centre for the interregional contact evidenced by the pottery of the Amuq F period in Syria, as well as the clay cylinders used for strengthening temple steps, known from the Uruk period. This seems to be at a point in time when sea connections were growing and the overland exchange links were declining, an issue returned to in Chapter 7.

The Unification of Egypt 3200–3000 BC (Naqada III) and the Transition to the First Dynasties

According to Bard (2000:65–6), the Naqada II b corresponds to EBA Ia in the southern Levant, while Naqada II c-d and Naqada III/Dynasty O correspond and were contemporary to EBA Ib in the Levant. In this period, the final events of unification and the acceleration of social change took place in Egypt, with developments that led to a centralized, territorial state and the emergence of the First Dynasties. This particular topic is not central for the issues discussed here, but there was a continued growth of interest in the procuring of exotic goods, as evidenced in a number of graves dated to the period. The unceasing increase in contact seen at sites like Maadi and Buto are not found further to the south in Egypt. However, from both Naqada II and III, cylindrical seals of Mesopotamian origin have been found in a few elite graves (Bard 2000:66). Expansion and political control was now demonstrated over a large region, writing developed as did administration and taxation systems. Exchange was now more direct: control was taken over resources themselves either by conquest or through expeditions and there is little room left for the type of exchange and contact we have seen for the preceding two millennia. In terms of the copper artefacts, this is apparent in several graves from the First Dynasty. At Abydos, Petrie found great quantities of copper artefacts in the Royal Tombs and at Saqqara, the tomb of Djer contained 121 knives, 7 saws, 68 vessels, 32 bodkins, 262 needles, 15 piercers, 79 chisels, 75 rectangular plates, 102 adzes and 75 hoes (Lucas 1962:200), clearly indicating a totally different mode of 'procuring and consuming' copper. This picture will be clearer after consideration in Chapter 6.

Lower Nubia in the 4th Millennium—the Nubian A-Group

The First Cataract is usually defined as the southern frontier of Egypt, due to travel and shipping problems. Lower Nubia is generally defined as the region just south of Aswan, down to the Second Cataract (Nordström 1972). However, as Trigger (1965:10) points out, these are not barriers, but hindrances to travel. From an economic point of view, Nubia is a region of great strategic importance, although when compared to Egypt, it is relatively poor in resources with fertile land capable of supporting only a small and dispersed population.

The northern limit of the A-Group can be set at Kubania, 10 km north of the First Cataract, while the southern border is more diffuse, and may be as far south as Turmuki. The southernmost cemetery is at Sarsa, although there are some minor differences (cf. Trigger 1965:10; Nordström 1972:17; Rampersad 1999:4–6). Pottery with some similarities to the A-Group has recently been found in a settlement context in the Kerma region just south of the Third Cataract, but the excavators have preferred to call it 'Pre-Kerama' (Bonnet 2001:2).

The settlement sites and graves are mainly confined to the Nile Valley (see Fig. 4.4), as there are deserts both to the east and to the west with little or no evidence of occupation except in Wadi Howar (cf. Lange 2000).

The Timing of the Nubian A-Group

Nordström (1972, 1996, 2004) has divided the Nubian A-Group into three phases: Early A-Group (?–3400 BC), Classic A-Group (3400–3100 BC) and Terminal A-group (3100–2900 BC), which is the chronological outline followed here. There are several works on the topic (e.g. Trigger 1965, 1976; Smith 1966; Adams 1967, 1977). Most recently important work has also been done on the origin of the Nubian A-Group by Gatto (1998, 2000). The Early A-Group is found between Kubania in the north and Dakka–Sayâla in the south, consisting mainly of cemeteries, but also storage pits at Khor Daûd. It is indicated by black-topped vessels, mace-heads of stone, flint knives and slate palettes, all with provenance in Egypt and found in grave contexts. The later stage of the Early A-Group seems to be contemporary with the Naqada II in Egypt and evidence suggests an expansion to Dakka, as there are only a few

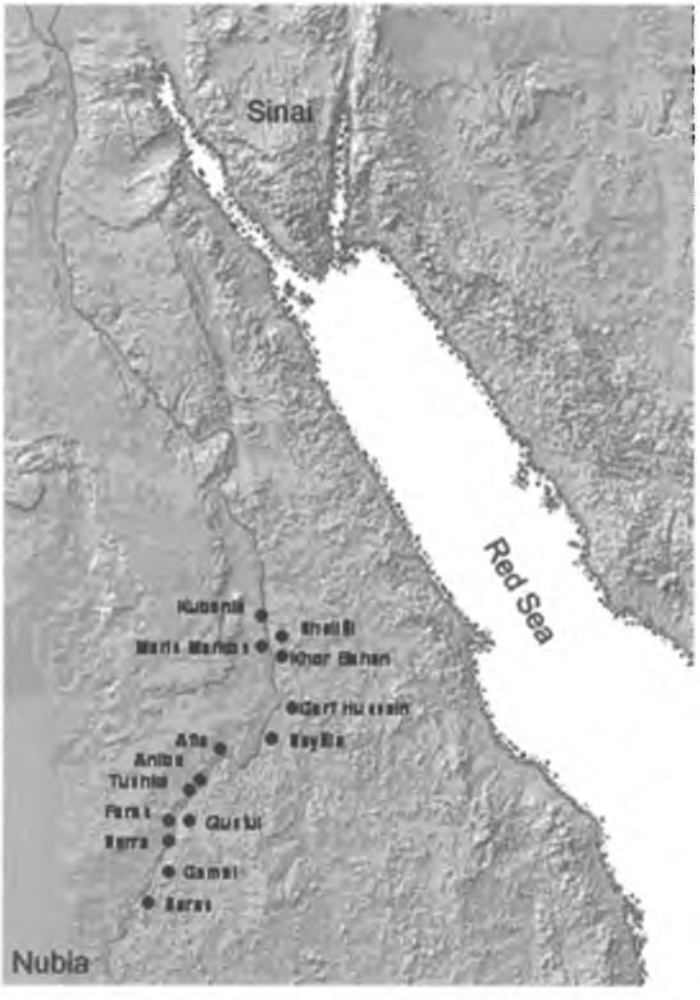


Figure 4.4 Major Nubian A-Group sites (from Nordström 2004:fig.1).

finds of Naqada I-II origin in Wadi Halfa (Nordström 1972:28–9). The earliest A-Group site in Lower Nubia is a cemetery at Khor Bahan, with many similarities to late Naqada I and early Naqada II periods in both material culture and in finds of cattle and goat bones (cf. Reisner 1910:115–27)

In the Middle (Classic) and Terminal A-Group, there is a rapid expansion southwards and Nordström (1972:29) argues, 'It is reasonable to suggest that cattle nomads in the regions adjacent to the river valleys formed an additional, perhaps symbiotic, component of this system'. At a stage when the Nubian A-Group increased its socio-economic development, indigenous objects disappeared. Therefore, the basis of the A-Group and a long cultural development is terminated (Nordström 1972:31). It is possible that Nubia was not able to keep up with these developments. The socio-economic structures were fragile and dependent on Egypt, as much of the previous A-Group was very much influenced by Egypt. As Nordström points out, there is a fundamental change in the late A-Group and in the archaeological material; this appears to be a complete breakdown of the Nubian A-Group. During the Terminal A-Group, Trigger (1965:78) marked a decline in number of sites, size and the prosperity in culture.

Graves and Pottery

Graves from the Nubian A-group are generally found in larger cemeteries and Nordström (2002) argues there are about 75 village cemeteries along the Nile floodplain, or near old river channels between Kubaniya and Saras East in Batn el-Hagar. The A-Group cemeteries may contain more than 100 burials, including secondary burials. Trigger (1976) suggests that this may reflect groups controlling a territory next to the river bank and, at least in the case of the early A-Group, the political organization was simple and centred around individuals or small groups. The grave complexes of the A-Group have revealed most of the information that has been recovered. This is exemplified by rich mortuary offerings, along with imported objects implying close exchange relations with Egypt, a growing concern for the afterlife and increased accumulation of wealth and luxury. The burial practice of the Nubian A-Group in general seems to have similarities to that of Predynastic Egypt (Smith 1962:64–9). Especially in the Classical and Terminal phases of the A-Group graves, their content seems to be gradually more elaborate (cf. Nordström 1996, 2002). This is particularly seen at Sayala Cemetery 137 (Firth 1927) and at Qustul Cemetery L (Williams 1986), where wealthy elites seems to have been buried. Interestingly, these extraordinarily rich graves seem to have a strong presence of women (Nordström 2002). At Qustul, Williams (1986) has suggested that the graves have similarities to Upper Egypt and may even be the origin of the first pharaohs in Egypt, although this is much disputed.

Pottery remains are divided between the pottery of Nubian origin and the pottery of Egyptian origin (Nordström 1972:33–94). Imported vessels of Egyptian types include wine jars, small necked jars, wavy-handled and cylindrical jars and open bowls of hard light red or grey ware, which were containers for wine, beer, oil, or cheese and were probably reused several times (Nordström 1972:22). Certain types of pottery are only found in the Classical A-Group, while others are only found in the Terminal A-Group (Nordström 1972:82–93). Towards the end of the Nubian A-Group, there seems to be greater sophistication and better quantity of Egyptian manufactured goods, reflecting the flowering of craftsmanship and the end of the Predynastic period.

Economy and Type of Sites

Not much is known about the subsistence pattern of the A-Group and the sparse evidence has definitely created a discussion on the issue. It is striking that the extensive grave material from the Nubian A-Group has yielded relatively little information on the subsistence strategy. However, indications of agriculture, pastoralism and hunting/fishing seem to be present to a varying degree.

Wheat, barley, date (wild), peas and lentils have been found in graves and on sites dated to the Nubian A-Group. From Afia, there are indications of food production based on cultivated wheat, barley and legumes, grinding stones and serrated chert blades, at least during the Terminal A-Group. Cultivation utilizing the floodplain, permitting small-scale agriculture seems to have been at least partially practised, but there is no evidence of fruit cultivation. Bones of sheep, goat, cattle and dogs were identified, as well as pottery tempered with cattle dung (Nordström 1972). Trigger (1976:35) suggests that goat and sheep have been more important for subsistence, rather than cattle, which were probably herded by the inhabitants of the Red Sea Hills. These issues connected to milk and pastoralism will be discussed further in the chapter on pastoral nomadism including whether the A-Group was a nomadic or a settled society. For the present, it is sufficient that there are pastoral indications, though the issue is disputed at sites like the 'Archaic Camp at Cemetery 41' (Reisner 1910:215–18), Qift (Firth 1915) and Faras (Griffith 1921).

The main settlement material from Lower Nubia in the 4th millennium lacks reliable stratigraphic and radiocarbon dates, as most of the settlement surfaces represent only fragmentary, insubstantial evidence of occupation, in contrast to the great amounts of material derived from cemeteries. Dating, beyond the classification of pottery found at the sites, still remains a problem for many of the sites. Rampersad (1999:500–502) has recently divided the habitation sites into sites with no structural remains (46), with structural remains (5) and rock shelters (3). This is essentially a modification of Nordström (1972:20–1), who divides the A-Group settlements of Lower Nubia into four categories:

1. Sites without permanent structural features (walls, mud floors, etc.), usually consisting of one or several layers of occupation, with numerous potsherds and other implements. Some of these sites had multiple occupational levels used by a small band or extended family. Nordström (1972:20) suggests simple reed huts, with a light wooden framework, such as Meris (Reisner 1910:215–18). A similar site is A.2 at Ballana, where a hearth was discovered, in addition to carnelian beads and small worked points. The site seems to be small, temporal and repeatedly used (Trigger 1965:76). Other small sites of a similar kind are Dabud, Qurta, Amada, Abu Simbel, Faras, and Gezira Dabarosa to mention a few.
2. Sites with house foundations of stone slabs, as at sites in the Er-Riqa district were surveyed, showing evidence of round houses built of crude boulders (Smith 1962:71). In Dakka, Firth (1915:9) found traces of settlements along the desert edge cemeteries and the cultivated area, containing rubble walls, deposits of ash, potsherds and bones of animals. The A site at Argin West (6.B.6) also contained numerous stone slabs (Nordström 1962:44). The only exception may be the poorly published house at Afyeh (Lal 1967).
3. Rock shelters with evidence of A-Group occupation in Lower Nubia have been found at Serras West, Korosko East and at Sayala/Khor Nashryia (Rampersad 1999:502,

with references). However, one may question to what degree they were utilized by the Nubian A-Group, as the rock shelter in Wadi Halfa (AS 24-H-4) has also yielded significant pottery from Predynastic Egypt (Nordström 1972:21).

4. Located on the east bank at Khôr Daud, a storage pit complex with 578 pits was discovered. There were no traces of habitation and the pottery is not typical A-Group pottery (Nordström 1972:21). The pits were 50-150 cm in diameter and 40-100 cm deep and there were no traces of structural remains, nor any hearths found adjacent to the pits (Piotrovsky 1967:128). Seventy-eight pits contained artefacts, mainly pottery in the form of polished red pots with black upper rims (black-topped pottery). A comparison of these vessels with reliefs and grave designs from the Ancient Kingdom points toward diary farming (Piotrovsky 1967:129). Flint tools, such as knives, scrapers, blades, etc. were found, in addition to a fragmentary bronze chisel.

Chapter 5 will further examine the issue of pastoralism in the Nubian A-Group. However, there seems to be certain pastoral indications, both with reference to sites and to economy.

Influence and Exchange

The influence of Egyptian products is found on most A-Group sites between Kubania and Saras, reflecting a continuous and increasing interchange between Upper Egypt and Lower Nubia. Nordström (1972:25–6) suggests that ebony, ivory and cattle may have been the commodities of exchange, while Egyptian export items during the Naqada period were beer or wine (transported in necked jars) and cheese or oil (transported in wavy-handled jars and cylindrical jars). Copper tools, other metals, stone palettes, beads, pendants, amulets of faience and stone, were probably all brought to Nubia. Various seashells have also been found in A-Group graves, both from the Mediterranean and the Red Seas, which points to either direct or indirect contacts over large distances. Piotrovsky (1967:130ff) has argued that cattle breeding played a significant part in the A-Group economy, arguing that Khor Daûd is a dairy site connected to pastoralists of the Red Sea Hills and Lower Nubia, due to foreign vessels in the storage pits. Exchange along the Nile is usually regarded as the most common and logical, although Säve-Söderbergh (1941:19–20) has pointed out that the Egyptians of the Old Kingdom preferred donkey caravans to transport most of their commodities. In later periods, cosmetics and oil especially seem to have been important, as well as ivory and slaves (Adams 1977:137). The exchange relations probably reached their peak in the First Dynasty and Trigger (1965) argues cheese, beer and other products must have also been exchanged. A Sixth Dynasty text states that the Nubians liked ointment, honey, clothes and oil (Trigger 1965:70–1, with reference to Breasted 1906:167) and this must imply products that the Nubians themselves did not have or produce. This created an opportunity for the people of Lower Nubia to engage in exchange, gaining profit from this activity and a significant power base for a rising elite—possibly 'chiefs' (cf. Edwards 2004:71–4). However, these are issues to be returned to in Chapter 6 and 8.

The End of the Nubian A-Group

Nordström (1972:18) argues that there is hardly any material from the A-Group manufactured later than the beginning of the First Dynasty (Nordström 1972:18). Adams argues that no Egyptian artefacts in A-Group graves are dated later than the Second Dynasty and this usually marks the end of the 'A-Group' around 2800 BC (Adams 1977:132). Arkell (1973:39–40)

suggests that the Egyptian goods found in A-Group graves were dated to the reigns of the third and fourth kings of the First Dynasty and that the A-Group came to an abrupt end. The conquest theory of Nubia by the Egyptians in the late 4th or early 3rd millennia (3100–2900 BC) is often based on the rock inscription at Jerbel Suliman, of Djer's conquest of Nubia (e.g. Arkell 1975:28, 52). This text is interpreted as being about a Nubian chief bound to the prow of an Egyptian ship, in commemoration of the conquest of two regions or villages, and is represented partly by hieroglyphs and by pictures. Another text is a fragmentary victory stele of King Kha-sekhem of the Second Dynasty. This has a military character, showing triumph over a Nubian. Adams (1977:135) suggests that Nubia was largely abandoned by its native population, perhaps as either a result of Egyptian encroachment, or of environmental change combined with Egyptian pressure, forcing Nubians to revert to a pastoral and nomadic existence, thereby leaving few archaeological traces. However, for the present, there are no clear answers to this.

Pre-Kerma and the Karat Group

As mentioned earlier, sites just south of the Third Cataract and partly contemporary with the Nubian A-Group have been identified as 'Pre-Kerma', but chronological and typological relations are still not clear. Rampersad (1999:116) argues that pottery has similarities to both the A-Group and C-Group, though it probably terminated around 2500–2400 BC. This is exactly the hiatus between the A-Group and the C-Group. Rampersad (1999:117) argues, 'one might speculate about the possible movement of A-Group people southwards into the Kerma area after about 3000 BC, at the time of the alleged hiatus in the occupation of Lower Nubia'. There are geographical differences, as it is located south of the Second Cataract, though there are also many similarities as, for example, with the pottery. What is striking is that Pre-Kerma does not appear to have played an active role in exchanges with Egypt. On the contrary, the Pre-Kerma burials indicate contact with the A-Group, as evidenced by the copper awl found in one of the graves (Honegger 2004b:63). The excavations at the Eastern Cemetery of Kerma have revealed large settlement areas, including palisades, post-holes, storage-pits and cattle pens, clearly illustrating a pastoral economy. However, this is an issue that needs more examination, backed by studies on the social processes of migration, as well as pastoral nomads.

The Karat Group may be contemporary to the early A-Group of the Second Cataract (Arkell 1975:29, with ref. to Marks *et al.* 1973). Nordström (1972:16–17) is more suspicious about the Karat group, found at 19 sites in the area between Korti and Ed-Debba. The pottery appears to have close similarities to the Developed and Terminal Abkan pottery, as well as the Khartoum Neolithic pottery, though the lithic material shows no affinities to either. Sadr (1991:91) argues that it is unclear whether the Katarat sites represent the herding sector of a mixed economy society, or if they are actual nomads, but he suggests that a pastoral adaptation of the sites is reasonable, as there are no semi-permanent bases in the settlements in the Nile Valley.

Concluding Remarks

Several of the Late Neolithic sites in Egypt seem to have parallels to sites in the Near East, although the development of agriculture and animal husbandry seems to be later. The first substantial communities seem to appear after primary domestication and the advent of agriculture in the Nile Valley. On the other hand, there seems to be a strong 'Neolithic input' from the Sahara to the Nile Valley. There appears to be two types of input to northeast Africa: cattle pastoralism possibly combined with millet and sorghum, sheep/goat pastoralism combined with barley and wheat, both meeting in northeast Africa. Most of these societies may have pursued mixed economies. This was a strategy which may have been found over large parts of the riverine settings of northeast Africa during the second half of the 5th millennium BC. In some cases this included the cultivation of domesticated plants and the herding of domesticated animals (Sadr 1991:83). For local or regional areas, the economic production seems to be focused on pastoral and agricultural production, exploiting the limited resources in the region. However, already in the 5th millennium, there appears to be some evidence of interregional contacts, which is followed by a substantial increase in personal wealth in Egypt, during the 4th millennium. Egypt, during this time, seems to be a centre of gravity with growing specialization and differentiation in the grave material seen at sites such as Hierakonpolis, indicating burials of powerful persons by larger accumulations of funerary artefacts and greater exclusivity. This may also be seen in the material from Lower Nubia, though at a different scale and faith. The Nubian A-Group emerges in Lower Nubia in the 4th millennium BC, when both food production and metal appears to have been well established in many parts of Egypt (Nordström 1972:1). The nature of the expansion of the A-Group varies, but it seems to be neatly connected to the Naqada. Few definite contexts of the A-Group have revealed domesticated animals, but the economic basis of the Nubian A-Group seems to be at least partially pastoral. If one uses the concept of secondary products, as applied by Sherrat (1981), there are indeed few indications of the use of products such as milk and yoghurt. The next chapter addresses issues of pastoral nomadism.

5 The Role of Nomadic Pastoralists

As discussed in the earlier chapters, the natural environment and climatic changes such as rise in annual rainfall during the 5th and 4th millennia BC had a direct effect on the extent to which it was actually possible to pursue nomadic pastoralism. In this chapter, the role of pastoral nomads will be considered both in a contemporary and a past setting in relation to northeast Africa and the southern Levant. There will also be references to both ethnographic and archaeological examples outside this region to provide a better understanding. Pastoral nomads will be considered on a very broad and general level, implying a specialization in animal husbandry and involving shorter or longer seasonal movements. In other words, nomadism is a way of life with a large degree of economic specialization, where cultural values are moulded in a mobile household. The ethnographic examples play only a minor role here, as the intention is to develop a general understanding of nomadic pastoralism within the region. The first part takes a closer look at the most recent and present context of pastoral nomadism in the region: types, production and consumption, social organization and values, as well as pastoral nomadic trade and links to sedentary societies. Thereafter, the manner in which pastoral nomads may be traced in the archaeological record is considered. Lastly the 5th and 4th millennia in both northeast Africa and the southern Levant will be evaluated in relation to some smaller cases of evidence. Key questions addressed in the last section of this chapter include to what degree secondary products (milk and wool) could have been utilized before the domestication of the donkey and camel during the 5th or 4th millennia and the role this had in both northeast Africa and the southern Levant. Sedentarization is also a central process when referring to pastoral nomads past (e.g. Prag 1985; LaBianca 1990; Finkelstein and Perevolotsky 1990) and present (e.g. Barth 1986). This issue will be touched on briefly as it opens up a field of its own. However, there is no doubt that the processes of sedentarization must have played a significant role in prehistory, creating cultural contacts and patterns of exchange. Examples of this could possibly be the Nubian A-Group, or in the latter half of the 4th millennium in the southern Levant.

Present Nomads in Northeast Africa and the Southern Levant

Animals and Types of Nomadism

> For all the cultural variety we see among nomadic pastoralists, the variation of domesticated animal species they raise is surprisingly small, making their comparison a variation on a single theme (Barfield 1993:5).

Both Khazanov (1994) and Barfield (1993) emphasize that there are only about six species that compose the majority of pastoral herds worldwide. To a large extent, each region has one key animal defining pastoralism culturally and which has the same function as glue in social relations. Or as Barfield (1993:10) puts it, 'What is really at work is an expression of a hierarchy of cultural value, for in each pastoral zone there is one species that excites the imagination and is viewed as the ideal source of wealth and satisfaction. In some societies the productive stock takes pride of place while others give the nod to transport animals.' Of particular interest here is the present-day practice of pastoralism in areas of northeast Africa and the Levant, where sheep, goat and camel are the three most important animals. It should be noted that camels cannot be pastured with small stock and are usually kept apart from the other animals. Also noteworthy is that camel-herders can migrate longer than sheep-herders (Khazanov 1994:55), but the familiar camel pastoralism of the Arabian deserts is of a more recent date (cf. Sherratt 1981; Bulliet 1990). It will therefore not be considered here unless there are features of general interest and importance. A large majority of pastoral nomads keep sheep and goats, with donkeys and camels used as transportation animals, and are often found on the margins of the deserts. The pastoral nomads raising sheep and goats are also well-known throughout Anatolia and the Iranian Plateaux, but as Barfield (1993:93) mentions, they do not share a common language, social structure, or political organization, but, rather, a common economy. Goats and sheep are found in the Middle East, north and east Africa, where they pasture together (Khazanov 1994:26). Goats are especially suitable in regions with marginal pasture, as they eat plants that sheep would not eat, but goats are less tolerant to humidity (Khazanov 1994:26, with reference to Dahl and Hjort 1976). In the Near East they are also an important source of meat. Sheep provide skins, milk and meat—as do goats and cattle—in addition to wool, which may be sold to other groups. The processing of both milk and milk products is a major activity for women during the spring and summer (see Fig. 5.1 and 5.2). The zone of cattle in the Sahel, south of the Sahara, will be briefly considered because this is a major component of pastoralism in northeast Africa in general. Generally, cattle require better pastures, more water and do not cope with hills and mountains as easily as sheep and goats (Barfield 1993:8). Khazanov (1994:58) argues that the Sudano-Sahelian zone is intermediate with reference to nomadic pastoralism, as the region seems to lack uniformity. Cattle seem to be more common than camels, as exemplified by the Beja, Fulani and Baggara herders, but there are also major differences compared to east African groups (Khazanov 1994:58). Furthermore, in the Sahel, zebu are herded along with camels, goats and sheep, while on the savannah, cattle and sheep are more common (Khazanov 1994:58–9). Normally cattle are not suitable for long migrations and require better pastures and more water than is usually available in the region. One additional advantage in areas where fuel is lacking is that dung may be used as fuel.

Figures 5.1 and 5.2 The present day milking of sheep in Syria, Jebel Bishri (photo: Milton Nunez).

In the Near East, sheep and goats are clearly among the most important animals for pastoral nomads, creating an integrated economy with both cities and villages and enabling them to sell their pastoral products. The character of pastoral migrations varies considerably, even among nomads of the same region, as movement is linked directly to access to pastures and water, in addition to the size and composition of the herd (Khazanov 1994:37–8). The composition of the herd is important as different animals have different requirements for water and pasture, and to the ecological, economic and political settings. In the Near East, nomads' social organization has given them both autonomy and political influence, as they are part of a larger sedentary agricultural region, including villages and bazaars, forming an integral part of the regional political system.

Khazanov (1994:53–9) argues that nomadism in northeast Africa and parts of the Near East is less uniform than elsewhere and can easily be divided into many subgroups which do not easily correspond to standard geographical borders. Variation and local particularities are important in order to understand the complexity of the region in terms of adaptation—there are no clear-cut boundaries and lines, but an integrated complexity and mixture of various types of nomads, village people and city people. To a large extent, this also forms different types of pastoralism into a complex relationship between people, animals and nature, with reference to species composition, carrying capacity of the land and the number of animals kept. There are numerous forms and variations of nomads and Khazanov (1994:17–25) has singled out four basic forms:

1. Pastoral nomadism proper is characterized by the absence of agriculture, not even as a supplementary income. This form is disputed among researchers, but it does not appear to be found in the regions analysed here.
2. Semi-nomadic pastoralism is characterized by extensive pastoralism with periodic changes of pasture. In this form, agriculture is secondary and supplementary income does not always meet demands. There is thus a dependence on the outside world. There may be small differences between this and semi-sedentary pastoralism. According to Khazanov (1994:19), agricultural activity influences their lives considerably and is generally found on the Eurasian steppes, Baluchistan, Arabia, north Africa and the Sahara.

> In some situations semi-nomadic pastoralism can be a relatively stable economic system and function for a long time in a more or less immutable form; in other situations it can be a transitional stage between pastoral nomadism and a mixed economy; and in others, alternatively, it can be a stage in development from a mixed economy to pastoral nomadism (Khazanov 1994:21).

3. Semi-sedentary pastoralism differs mainly from the former in that agriculture plays the predominant role in the economic sector, although this may also imply short seasonal migrations both in time and space. Depending on the definitions used, this may more or less correspond to the concept of transhumance. However, as Khazanov (1994:24) points out, this form of pastoralism often co-exists with semi-nomadic pastoralism and pastoral nomadism in the Middle East and north Africa.
4. Sedentary animal husbandry is distinguished by animal husbandry as only a minor supplement to agriculture and subsistence. Khazanov (1994:24) maintains that this is not the basic form of economy in traditional and primitive societies.

It is important that nomads often have a dominant role or position in the zone they inhabit, utilizing either several neighbouring or separated ecological zones. At the same time, they may either partially or fully share the same zones with agriculturalists (Khazanov 1994:33). There is great variation in how nomads utilize the different ecological zones, depending on the character of the livestock and the natural environment. Khazanov (1994:35) further points out that a symbiosis does not only include co-existence, interaction and interdependence, but also mutual benefit, although this might be difficult. An excellent example of this is Barth's (1956) study from Swat in North Pakistan. Here, the regions do not correlate with ethnic groups, thus it is necessary to focus on economic activities and relations to other groups. As a consequence, Barth illustrates a symbiosis among different groups utilizing different ecological zones, which may result in either peaceful co-existence, or conflict depending on the various types of social organization.

Pastoral Production and Consumption

The most important economic factor of pastoralism is obviously the animals and their products, such as milk, wool, hide and meat for consumption or exchange. In addition, animals used for transport, such as camels and donkeys, may play a significant role. As Barth notes (1973:12–14), there are some basic characteristics of the pastoral production system that contrast with other systems. The basic nature of pastoral capital is that it is perishable. Compared to an agricultural production system, land is imperishable and cannot be increased in dimension by the investment or sale of its products. According to Barth, there is a striking difference especially in the growth potential, as the pastoral system is always faced with possible rapid growth or decline as the products come in the form of direct capital gains. The agricultural system, on the other hand, has no comparatively immediate manner of growth, unless there exists institutions that may facilitate conversion, where food is transferred to rank through feasts, etc. In such a setting there should be some sort of collective economic institution bridging the two types of production systems. '

> The buoyancy of the pastoral sector in their economy may make such mixed-economy farmers more prosperous than their more purely agricultural fellows, even if they tend to occupy much more marginal areas; however, left to their own devices, they do not pursue growth relentlessly, but are happy to remain small farmers once a certain level is reached (Barth 1973:15).

In other words, pastoral surplus is generally in the form of livestock, which is continually at risk. Further, there is, as Dahl and Hjort (1976) point out, a matter of size and scale of herd composition, and a number of factors influence this such as drought, sickness and political factors. Although the sedentary farmer may also be affected by some of these factors, the farmer has to a greater extent the possibility to store cereals for later use and in this way accumulate surplus for other purposes. This leads to what Barfield (1993:15) has noted. Pastoralists have a strong incentive to exchange their animal surplus for other goods. The manner in which the pastoral products are consumed depends on a number of factors, like ecology, size and type of herd, relations to farming societies, and the cultural or religious setting. Khazanov (1994:39) notes that there are considerable differences in the *ways* the basic pastoral products are used (milk and milk products, meat and blood). In the Near East especially, milk and vegetables are important products, while meat is less important than in other nomadic regions (Khazanov 1994:57).

Organization, Value Systems and Identity

> The traveller in the more isolated parts of the Near East should not be surprised to see groups of migrating nomads passing through villages whose inhabitants dress in the same manner as the nomads, speak the same dialect, employ the same range of household utensils, possess the same species of domestic animals and, in some cases claim the same tribal affiliation. Differences there certainly are, but these are often ideological, organizational and economic rather than 'cultural' (Cribb 1991:65).

The social organization of pastoral nomads may be divided into two levels. First, and most significant, is the family level where kinship, decent, lineage and clan are the most important units in the social organization. The family serves both as protection and unity, but also legitimizes social inequality. Secondly, on a larger political level, tribal confederacies are large alliances of up to several hundred thousand people, formed through alliances and conquest and also include tribes or clans that are not related (cf. Barth 1986). These forms of social organization are often mirrored by sophistication in the organization of the neighbouring sedentary societies, with whom they interact (Barfield 1993:16–17). The tribe is, in this way, a form of social organization and ideology, while Bedouin is a form of cultural identity (Eickelman 2002:66). Nomadic societies have often been described as segmentary, and although very imprecise, this points out a significant feature of the society: the fact that there is no concentrated centre of cohesion which can impose its will on other groups (Gellner 1973:4). Tribes or groups may have both a nomadic and a settled component, together with political leadership and movements. Barth has argued that such a group may be identified as an ethnic group.

> Where each sector is monopolized by a discrete ethnic group, I would argue that it is well-nigh automatic and inevitable that the pastoral group, favoured by the inherent potential of the pastoral regime of production, will have the advantage over the agriculturalists, and by virtue of their mode of production become the dominant group. ... Thus pastoralists may be merely an occupational category, as is trader or craftsman in many societies, or it may be descriptive of a whole tribe or people (Barth 1973:16).

Haaland (1969) has also pointed out that in Western Sudan economic factors make people change their ethnic identity in processes of nomadization and sedentarization.

Pastoral groups may exist within or outside of settled societies and may in fact, as Barth (1973:16–17) indicates, play a dominating role because there is an inherent growth potential

of pastoral production tied to a self-perpetuating group. Barth (1973:17) argues further that this may lead to a division of class, based on control of the pastoral capital, especially if the social organization allows occupational specialization. Here, only social organization prevents the development of inequality and social differences. He mentions further that an accumulation of wealth and influence by pastoralists would lead to a stratification system, which they predominate (Barth 1973:17).

Indeed, this is a different value system, where livestock is the important 'capital'. It also implies an informal 'landownership', with fluid borders and areas, rather than the rights to specific regions. Despite this, rights to pasture land may be a form of landownership. Most importantly, livestock is for the most part privately owned, while there is corporate ownership of pasture. Ownership is, of course, a complex issue in pastoral nomadic societies. It is also a source of conflict. Ownership is connected to factors such as environment, economy and social organization. Nomadic pastoralists have developed different value systems and organization systems depending on their specific cultural, ecological and historical relations to one another. Social values are emphasized, taking definite predominance over material values, which are an integral part of the cultural components of the Middle East region.

As animals play a vital role in the economic organization and are continually at risk, this also encourages the use of animals for social transactions. Animals not only play an important role in marriages and political support, but also function as a social safety net in times of difficulties. Ethnographic studies have shown that high production comprising of, for example exchange, milking, butchering and herding, is laborious and does not leave much time for other activities (Cribb 1991). In general, males are associated with the herding of animals, transportation to markets, part of the maintenance of the herd and procurement of raw materials. Female roles are, on the other hand, connected to the processing activities of milk production, weaving and cooking (Barfield 1993:100). Environmental effects, for instance drought and diseases, may affect pastoralists and farmers equally, but a close relationship with domestic animals may also affect humans by the transfer of diseases from animals to humans. Livestock is not only mobile wealth. Once it became possible to utilize secondary products, animals became a mobile storage for a constant food supply. To a large degree, the nomadic way of life limits the opportunities for a division of labour and the development of handicrafts as an independent branch of the economy (Khazanov 1994:82).

Seasonal movements depend on a number of factors: the distance, topography, the quality of pasture, water and the competition from other nomadic tribes and settled farmers. The symbiosis between farmers and pastoral nomads may, of course, lead to conflict, especially during the late spring and summer before the farmers have harvested and crops are ultimately destroyed. On the other hand, the animals leave dung, which fertilizes the soil. This can still be seen in parts of the Levant, in the Lower Jordan Valley and in northeast Syria, where the cycle of pastoral nomadism is integrated into the agricultural cycle. According to Khazanov (1994:56), it was only in north Africa and countries of the Fertile Crescent that this joint utilization of the same ecological zone with sedentary farmers acquires great significance. Marx (1967) points out that the Bedouins of Negev and Sinai bury their dead close to water resources in central tribal cemeteries in areas which they frequently visit. Sacred sheikh tombs are found throughout the southern Levant and function as a focal point of social activity where burial grounds develop.

Trade

> It was not by chance that all the great overland trade routes of antiquity and the Middle Ages were pioneered by nomads or with their participation (Khazanov 1994:209).

In this section, trade is considered specifically between nomadic societies and sedentary societies. Khazanov (1994:202–12) argues there should be differentiation between direct trade and exchange between agricultural and urban societies and between different sedentary societies as mediators in trade or exchange. The first is not necessarily based on regular contact, as nomads are interested in trade or exchange because of agricultural products, as well as handicraft production, which they either do not produce at all, or do not produce in sufficient quantities themselves. Barth (1964) illustrated that grains are usually obtained from sedentary societies, usually in exchange for pastoral products. However, this exchange is not on a regular basis, as nomads rarely have sufficient surplus for a frequent trade or exchange with agricultural societies. Barfield (1993:99–100) notes a similar example from northeastern Afghanistan, where pastoral nomads are the major purchasers of wheat from small farmers in mountainous regions, who otherwise would not be able to transport it to market. This illustrates clearly that there is no need for a centralized authority or local markets to engage in trade and exchange with pastoral nomads—ecological and geographical characteristics may play a role. It also illustrates the needs of sedentary farmers to exchange their products. Although agricultural societies were not dependent on pastoral products, they were possibly a vital factor in securing supplies. The character of the nomadic life and production does not leave much room for surplus to be traded or exchanged and this would depend on the specific nomadic society and the social differences within the society. There may be social and personal motives to stabilize and strengthen economic and social positions that may include the introduction of luxury items. However, as nomads are the moving partner, they would often play the active partner in exchange relations. Nomads would obtain agricultural products including dates from villages and oases, while the agricultural societies would, in most cases, have a demand for meat and pastoral goods, such as wool, milk and yoghurt. In the Middle East, this, in addition to historical and ecological grounds, has created a close and distinct relationship between nomads and sedentary societies, as there are short distances in the Middle East between different ecological zones. The secondary role of mediator is connected especially to caravan-trading, using camels in long-distance exchange. As the camel was introduced and domesticated much later in the region, it is not of particular interest here. The practice of indirect long-distance trade may well have been a feature without the use of camels, where caravans would pass through several parties rather than one single group, but direct change would be the most profitable method of trade. Nomads would have special advantages due to the knowledge of the region, mobility, animals and the possibility of crossing boundaries. Eickelman (2002:79) mentions that the Bedouin virtues of personal autonomy and mutual support are found among the camel-herding Rwala of Saudi Arabia today, who show skills to succeed as entrepreneurs, taking advantage of rapidly fluctuating economic and political opportunities, and preserving both autonomy and political influence to several authorities. This shows the flexibility and the dynamic character of the nomadic societies.

Relations between Urban Centres, Villages and Pastoral Nomads

It was Ibn Khaldûn (1989) who in the 14th century AD noted overlapping and complementary relations between villages, urban centres and nomads. Still, although there have been

enormous changes in the region over the last 100 years, one may find this classical division in several places throughout the region today (see Fig. 5.3). Pastoral nomadic societies have for millennia had an impact on the settled societies, both in terms of cultural, economic and political influence.

Although the focus in this analysis lies on pastoral nomadism, in order to get a complementary picture, it is necessary to include villages and urban centres. Thus, it is important to understand the interdependence between these classifications. The categories are not absolute, but may be a useful way of understanding past interrelations and contacts among different groups, although relations between these groups are complex and changing—in the past as in the present. There are noteworthy differences among these categories, but there are also similarities and linkages. During this brief look at contemporary villages and urban centres, it is important to remember that the basis for the centres or civilizations that developed at the end of the 4th millennium is established on the surplus of agriculture collected in the form of rents from landlords, or taxes from 'governments'. Eickelman (2002:47) points out that the balance between the state and the region has significantly altered in favour of the state over the last 100 years. In a historical context with the development of Islam in the Middle East, this triangle of interaction between nomads, sedentary and urban populations may be seen as a reflection of interdependency and mutual influence. Although Barfield (1993) was referring to Afghanistan, he also notes that nomadic pastoralists were not isolated and must be understood in relation to sedentary people due to the wide network of relations with the outside world.

On the other hand, nomadism in its general sense has the ability to be symbiotic and Gellner (1973:2) suggests that many of the pervasive cultural traits of the region are built around and facilitate this symbiosis. Barth (1973:11–12) has suggested that it is necessary to identify some crucial variables in the interrelation between nomads and sedentary societies.

Figure 5.3 Bedouins on the outskirts of present day Ramallah; the highlighted area shows their location (photo: Nils Anfinset).

This is not only based on the differential territorial and subsistence pattern between the two, but rather the differences in the systems of production with reference to how they adapt, exchange and articulate. Moreover, he suggests a focus on the total activities of a region. Concentration on types of activities, as opposed to types of people, would bring the focus towards systems of production. It is the total composition of this production system, including agriculture, exchange and occupational specialists, of which society is compromised. It is necessary to study nomads and settled people in a region under a common perspective, understanding their dependency, dominance and stratification. Only then is it possible to understand the overall social organization of a region. This would give an understanding of the systems of production in a certain region as a social unit or type of community, together with the dynamic implications of this and their interconnections with these communities (Barth 1973:12). His point of departure is that a pastoral mode of production has inherently contrasting properties of production system when compared to other production systems within the same region. Therefore, Barth (1973:18) argues that the interaction between pastoral and agricultural societies is seen in the basic similarities in the diet they consume, composed both of agricultural and pastoral products, although the growth capacity of pastoral groups also depends on ecological factors.

> Given these two circumstances, we would expect to find long-term trends in exchange relations and capital accumulation that favour the more pastorally oriented sector of the population, and partially full-fledged pastoral nomads, leading to the dominance of such groups in local systems of stratification (Barth 1973:18).

It is in fact as Barth (1973:18–19) put it: the 'nomads—and traders—who have been actively upward mobile, while cultivators from the stable bottom of the pyramid, and landowners (in part) occupy the top positions, but are sustained there by stagnated enterprises'. This implies that agricultural societies would depend on their interests and capacities, which indeed would affect the impact of the pastoral nomadic groups and their possibilities—although this would also depend on ecological factors, internal and regional stratification (Barth 1973:19).

One effect of this is interaction between pastoral and agricultural groups, which is, in effect, a region of fusion of agriculturalists and mixed farmers, or partly or fully fledged pastoral groups. On the other hand, the differences are mainly found in the things produced and the nature of the productive process (Cribb 1991:23). From a social point of view, a more differentiated society would actively strive for contacts and interaction with the outside world. Nomadic pastoralism is a specialization utilizing important economic niches, and very efficiently exploits seasonal variations. The term 'specialization' is connected to whether the economy was based on meat or secondary products, such as milk, yoghurt and wool. There are great variations among the types of nomadism and animals exploited, but most do have complex relations with cities and villages, which has nothing to do with kinship. These relationships are reflected by pastoral nomads as active partners in exchange and trade relations, as well as their distinct organization and value systems created by a distinct identity.

Archaeology and Nomadic Pastoralists

This section will briefly discuss the possibilities and difficulties of identifying nomads in archaeology. From a general point of view, there are great methodological problems to the identification of nomads and types of nomadism. Nevertheless, it is argued here that identifying

pastoral nomads is possible, on the basis of the reasoning outlined in earlier chapters, as well as in the important work mentioned below. The major issue is how archaeologists should be able to identify forms of human behaviour in a desert environment.

Identifying Pastoral Nomads in Archaeology

For more than 60 years, much of the discussion on pastoral nomads and archaeology has centred on the actual visibility of nomads in the archaeological record. Childe (1936:81) argued long ago that, 'Pastoralists are not likely to leave many vestiges by which the archaeologist could recognize their presence. They tend to use vessels of leather and basketry instead of pots, to live in tents instead of excavated shelters or huts supported by stout timber posts or wall of stone or brick. Leather vessels and baskets have as a rule no chance of surviving. Tents need not even leave deep postholes to mark where they once stood'. Cribb (1991:65–6) has pointed out that Childe's view of pastoralists led a generation of archaeologists in the Near East to ignore the possibility of tracing pastoralists, although mobile groups clearly leave things behind (cf. Cribb 1991). Yet, over the last 10-15 years, there has been increased interest in identifying nomadic remains, especially with the works of Sadr (1991) and Cribb (1991).

Hole (1974, 1978) was a pioneer in the field of identifying pastoral transhumant groups on an archaeological site in the Zagros Mountains using ethnoarchaeological methods. Hole focused on features that would be traceable in the archaeological record, such as fauna remains, tools, storing facilities and migration routes. In this sense, there has been much focus on the *methods* for identifying pastoral nomads in the past in archaeology.

For the southern Levant, Rosen (1988, 1992) especially has concentrated on meticulous survey methods covering large areas by walking, in addition to regional sampling, site registration criteria, site preservation and visibility, and excavation methods. Banning *et al.* (1994) and Köhler-Rollefson (1992) have also stressed that pastoral nomadic sites are found in areas not easily accessible and away from villages. However, the latter is partly right, but alternatively and keeping in mind the strong symbiosis among pastoral nomads and settled societies, one would expect nomadic sites to be just on the outskirts of a village or a small urban centre. In the southern Levant, there has been an increased focus on aspects of pastoralism with the work of Levy (1983), Prag (1985) and Rosen (1988). More recently, a large and comprehensive volume on anthropological and archaeological perspectives on pastoralism in the Levant (Bar-Yosef and Khazanov 1992) has discussed broadly a variety of approaches in time and space. Additionally, Finkelstein (1995) does the same in connection with the archaeology of Negev and Sinai. However, few of these actually question the problem of identifying nomads and the methodological approaches to this, as do Cribb and Sadr. To a lesser extent, this has been a focus of investigations in northeast Africa.

Cribb (1991:68–83) has focused on the organizational material culture of nomads and divided this into three dimensions, in terms of archaeology, as they are to a large degree limiting factors to any pastoral system:

1. When the material culture exists: is the material culture permanent, when was the site occupied or unoccupied, was the material culture circulated to other sites? This may be distinguished between portable or non-portable material culture.
2. The nature of the material culture from perishables to durables.
3. The value of the items in terms of difficulty, or possibility of replacing them.

Cribb uses these dimensions as a supplementary argument for the visibility and the possibility of identifying nomads in archaeological contexts using material culture. Here, pottery may be permanent or portable material culture depending on its size, shape and function. This is supported by ethnohistorical descriptions of nomadic material culture, showing the same basic inventory as today, although there are now rapid changes with the use of new materials and products, which alter what may be found in the archaeological record. Still, the material culture is important, although our perception of nomads in archaeology has theoretical considerations. Cribb (1991:68) argues that there is a need to develop appropriate techniques for the location of nomadic sites, suggesting clear criteria for the identification of sites as pastoral or nomadic. Yet, there is no simple division between the location being a pastoral or nomadic site, as the former may include the latter and vice versa.

For northeast Africa, Sadr (1991) contends that pastoral nomadic groups can only be documented on a regional scale, using a methodology based on large-scale settlement pattern studies. Most of the traditional methods are insufficient as they only focus on a local level, not on the regional adaptation. Sites with a large number of faunal remains may be attributed to nomadic pastoralists, although there are several drawbacks to using animal bones and animal mortality (Sadr 1991:13). In addition to animal enclosures or corrals, this may provide information on what type of pastoralism was pursued. Site location, may be indicative of seasonal occupation, although as Sadr (1991:14) argues, one must be cautious in attributing small insubstantial sites to mobile herders as they may in actuality represent the remains of short-term sedentary farming societies, as known from modern Sudan. Therefore, the length of the occupation of a site is of great importance. Nevertheless, the opposite may be the case of the Bedouins of Jebel Bishri in Syria, where they build permanent houses to be inhabited for part of the season, with small garden plots outside the houses. In an archaeological context, this could easily be interpreted as a sedentary society. With reference to the Chalcolithic site of Horvat Beter in the southern Levant, Dothan (1959a:32) argued that the well-built structures found on the site could not have been constructed by nomadic or semi-nomadic people. This clearly illustrates the attitude towards nomads in general. Substantial stone structures do not necessarily indicate nomads or the opposite—sedentary agriculturalists. In cases where herders (either sedentary or mobile) of different groups seasonally occupy the same territory, Sadr (1991:14) argues it should be possible to stylistically recognize one as foreign to the other. In this sense, Sadr (1991:15) emphasizes the distinct contrast between the modern settlement pattern of agricultural and mixed economy population, on the one hand, and the ephemeral or seasonally occupied nature of the nomadic settlement pattern on the other. It essential to note that some pastoral groups may be highly dispersed for part of the season when resources (pasture) are scarce, while in other seasons when resources are easily available, there may be large aggregations of people and animals within a small area. As there is a wide range of different types of pastoralism, as pointed out in the previous section, the traditional methods suffer as individual sites may easily belong to several types of pastoral populations, but this can be overcome by considering regional data (Sadr 1991:20). Sadr (1991:20) stresses the *method* making it possible to distinguish between long, medium and short-term occupations, especially focusing on the depth of accumulated debris, although this is more difficult for the short-term sites. Another possibility is to index how much surface artefact density reflects how long an occupation remained in one spot, and Sadr (1991:20) suggests a metric density on pottery (and flint) indicating low, medium or high density. This

could also be combined with the thickness of the deposits. Thus, Sadr (1991:22) suggests that with combined settlement, faunal, and environmental data, regional populations can be identified with reference to their economy and degree of pastoralism. The difficulty is determining which recognizable settlement types may identify a nomadic pastoral site and what activities archaeologists may discern.

Another point has been made by Haaland (1987) who has stressed the significance of water storage in dry regions. This would certainly also have archaeological implications for the high frequencies of scrapers (cf. Henry 1995) on Neolithic sites in the Sudan, which may reflect the importance of pastoral production.

> In a pastoral economy where people have to move long distances from permanent water supplies, hide containers made for transporting water, like the containers (*girba* in Arabic) used in the northern Sudan today, would have had obvious advantages compared with breakable containers. One would thus expect that the migratory movements of pastoral groups in this environment and the increased need for hide containers for water for human and animal consumption would imply a greater use of scrapers for hide preparation than the case would have been if animal husbandry had been absent (Haaland 1987:28).

Nomads and Archaeological Culture

Although nomads are difficult to perceive in the archaeological record, it is a paradox as Cribb (1991:65) has pointed out, that they do not constitute an archaeological 'culture' in the Childean sense. For archaeologists, the study of pastoralists has to a great extent, focused on the material culture, which may also have implicit uses from known materials found in settled contexts. Although it may be debatable whether the Nubian A and B groups were at least partially nomadic, the lack of materialism lead Reisner in the early 1900s to an identification of a B-Group in Lower Nubia. Another problem may arise when artefacts from other known archaeological cultures are recovered. These may have been transported or exchanged to the nomadic sites but could then be mistakenly classified as an extension of a known archaeological culture, possibly connected to, for example, strategies of transhumance. As pointed out by Cribb (1991:80), to a large degree nomadic material culture tends to reflect that employed by sedentary groups. Therefore, the perception of nomads in archaeology is based on the theoretical level, on how analytical concepts, such as culture, are used and on the possibility and ability archaeologists have to move beyond the observable features in the archaeological record. However, pottery known from other large sedentary sites way well tell us of contact and interaction, rather than give the perception of a dominating sedentary 'culture'. As already seen in the preceding chapters, much emphasis in research (also in the Chalcolithic period) is based on an assumption of the sedentary as representing a positive advancement. Although nomads are mobile, this does not preclude the presence of pottery or other non-perishable goods, as is clearly pointed out by Cribb (1991:65–83). Nevertheless, the challenge in archaeology is to put these small pieces of information into a system which allows for the treatment of sites as an expansion of agricultural societies, to permit understanding and acceptance of regional sites in arid zones as various forms of pastoral adaptation.

As pastoral nomads are concerned with both production and consumption of pastoral products, one would expect to find evidence of this in the archaeological record. This would also from time to time include stone grinders and slabs (cf. Cribb 1991), as most pastoral nomads have a mixed economy, including some cereal farming. Shallow stratigraphy with

poor finds of pot sherds, some lithic material, stones and small pits having the size and the shape of a tent, in addition to corrals, may be a feature of pastoral nomads. Such sites must be critically evaluated on a regional scale. Together with ethnoarchaeology, historical sources and theoretical consideration of the concept of culture, this may be a useful avenue toward a greater understanding of pastoral nomads in archaeological contexts.

Pastoral Nomadism in Northeast Africa and the Southern Levant During the 5th and 4th Millennia BC?

The village is usually considered the most significant and important analytical category in the Middle East, as it is the oldest category and the majority of the population has, up until quite recently, lived in villages. Moreover villages have for millennia played a significant economic role. This has mainly been connected to the scarcity of water resources in the region and the resultant irrigation systems, which are vital for agricultural production. Still, it is necessary to question if the village societies of the 5th and 4th millennia really were self-sufficient and if there existed a connection to pastoral nomadic groups. Farming societies in marginal areas are never truly agriculturally self-sufficient, and identity and status are connected to the ownership of land and water rights in a social system where the land itself is connected to social wealth and prestige. However, contemporary studies in the region have illustrated that presently, and most likely in the past as well, factors such as ownership, rights and social prestige change significantly.

Pastoral nomadic societies have for millennia had influence on settled societies in terms of cultural, economic, political and linguistic impact. Therefore, nomads cannot and should not be isolated analytically. A good example is the very mobile, Semitic-speaking Amorites from Mesopotamia, who operated on the flanks of the settled societies, such as Mari on the western banks of the Euphrates, keeping large herds of cattle, sheep, goats and donkeys (cf. Prag 1985). Another is the caravan town of Petra in Jordan, founded on the edges of the Roman Empire, based on trade with the empire and the world beyond and functioning as middlemen. Hence, it is here necessary to look at the origin of pastoralism, as well as specialized pastoralism. Thereafter, consideration is owing to features that may support the existence of specialized pastoralism, with reference to rock art, the Nawami burials of Sinai, animal figurines and some selected sites and areas that may also support specialized pastoralism. Lastly, the analysis is put into a larger context with consideration of the interrelations between nomads, villages and the development of the first urban centres in the region.

Origins of Pastoralism

The actual origin and spread of pastoralism is not significant here, but it is important to understand because it has formed the major questions and theories connected to pastoralism. Moreover, the origin of pastoralism is also connected to specialized pastoralism, its origin and development. Pastoralism has played a vital role in the understanding of social complexity and population growth in cultural evolution. In reference to Scandinavia, Sven Nilson suggested in 1868 that population growth led to a shift from hunters and gatherers to pastoralism, and later from pastoralism to agriculture (Trigger 1989:8, 80). Much inspired by the Enlightenment period, Nilson and others focused on the technological aspects of

human progress. Many viewed nomads as societies that were not fully developed. During the 20th century this theory has lost much interest, especially after the archaeological discoveries in the Middle East by Braidwood (1961) and Hole, Flannery and Neely (1969), with the identification of the broad-based, food-producing economies of the Hilly Flanks, where herding also played a significant role. Along the Hilly Flanks of the Taurus-Zagros belt, there is a high frequency of wild sheep and goat hunted prior to the advent of agriculture. This illustrates long and intimate knowledge of these animals before domestication, and the later initial domestication of these animals was a reaction to depletion of game animals in the early Neolithic (Bar-Yosef and Khazanov 1992:4).

Sheep, goat and cattle were among the oldest domesticates and have been found in early sedentary farming societies, clearly indicating that these societies relied on both animal husbandry *and* agriculture. Several millennia later, nomadic pastoralism developed as a specialized economic and cultural adaptation associated with the domestication of several new species and new transportation technology. It is important that during these first millennia, domesticated animals are integrated into a mutual relationship with humans. The domestication of sheep and goats is usually connected to the Neolithic settlements of the early Holocene, but it was not until the 5th millennium that indications are found of pastoral nomadic populations in the Levant and northeast Africa (Trigger 1985; Clutton-Brock 1989; Sadr 1991, see also Henry 1995:353, for further references). There are also earlier suggestions such as PPNB at Azraq and Jebel Bishri in Syria, though this must be a different kind of pastoralism (cf. Anfinset 2006b for further references).

In the southern Levant, Köhler-Rollefson (1992:11, with references) has argued that goats came under cultural control some time during the PPNB period, while cattle, pigs and possibly sheep came under this control during the Pottery Neolithic. However, the strongest evidence is found in the period between 6000 and 5500 BC. Rosen (1988) places the origin of pastoralism during PPN, while specialized pastoralism developed as a result of this during the Neolithic period as part of the evolution of Neolithic societies and their subsistence systems. Nevertheless, there is a general lack of evidence in both Sinai and the Syro-Arabian Desert (cf. Bar-Yosef and Khazanov 1992) which could have contributed to both the understanding of regional development and a possible spread to northeast Africa. In the southern Levant in the PPNB, goat seems to be the basic animal at sites like Ain Ghazal and Beida, though within an extremely broad economy based on both wild and domestic resources, where there is a steady increase of reliance on domestic goats and a gradual declining dependence on wild animals (Köhler-Rollefson 1992:12–13). Köhler-Rollefson, therefore, suggests increased conflict between pasture on one hand, and crop cultivation on the other, where there were two possibilities. Either satellites are formed sufficient distances from the main site, or advantage is taken of animal mobility where goats are moved seasonally from the permanent settlements and cultivated fields (Köhler-Rollefson 1992:13–14). According to Köhler-Rollefson (1992:16), this would have led to both a specialization in agricultural activities, as well as a development of semi-nomadic pastoralism already during PPNC in the beginning of the 6th millennium BC. However, it is not clear if this semi-nomadic pastoralism would have been based on meat production or secondary products, such as milk and wool, as she notes that nomadic pastoralism might not have been possible if herders had not known the possibility of utilizing these products. What is important here is that the first 'stage' of pastoralism in the southern Levant was based, to a large degree, on goat and, to a lesser extent, on sheep and cattle.

For northeast Africa the picture of domestication and animal type is more complicated as mentioned in the previous chapter. Wendorf and Schild (1980, 1984) have suggested a separate development of domesticated cattle in eastern Sahara in the 7th millennium BC (cf. Ehret 1993). Later evidence also points toward early pastoral groups in the eastern Sahara, although it is doubtful if these were specialized pastoral nomads. Large bovid bones identified as cattle have been recovered, together with significant amounts of wild species, such as hare and gazelle. There were pits found, which it was suggested were dugout waterholes. The environment indicates that only small mammals could be supported, therefore, humans must have introduced cattle to the area. Several have doubted this early interpretation of domesticated cattle (e.g. Smith 1992a, 1992b), as there are a number of sites associated with both cattle and small stock on the Mediterranean coast of the southern Levant. Both domesticated sheep and goat in Africa have their progenitor from the Middle East and Smith (1992a, 1992b) therefore suggests a gradual southwestwards spread of pastoral groups from the Near East. He does not rule out the possibility that, at least in one part of the Sahara, indigenous domestication or experimentation of cattle took place through intensive use of wild cattle (Smith 1992b:54, 56). Smith (1992b:57) argues that besides the meat the fat from the cattle may have been of great importance. As we will see later, there is no evidence of specialized pastoralism in northeast Africa until the very end of 4th millennium BC. Still, these early pastoral groups may, of course, have been based on a meat economy, combined with hunting and foraging. There are no equally early finds of possible domesticated cattle in the southern Levant, which should at a minimum indicate that this is a northeast African phenomenon. Smith (1992b:57) argues that climatic improvements in the Sahara around 5000 BC opened up the utilization of the grasslands, coinciding with the introduction of domesticated small stock from the Levant. This led to a colonization of the Sahara by pastoral groups who adopted a mixed herding strategy, with both domesticated cattle and small stock. He further points out that from here a pastoral economy spread rapidly both west- and southwards to other parts of Africa during the Neolithic periods of Egypt and Lower Nubia. Today pastoralism is known south of Sahara among groups like the Masai and the Nuer who for the most part fully depend on cattle as a source of income. These groups intercept agricultural areas and tend towards mixed farming, as similar groups probably have done in prehistory as well. By the end of the Predynastic period in Egypt, a pastoral cattle-breeding economy resembling that of today had been established over much of northeast Africa. Interestingly Frankfort (1956) has pointed out that the near association between the early kings, queens, sky and sun were metaphorically identified with cattle, and noted close similarities between the deformations of the horns of cattle found in southern Sudan and those shown in the early Egyptian tomb paintings.

Trigger (1965:63–4) has suggested that pastoralism spread through out the Sahara between the 5th millennium BC and the end of Neolithic wet phase, and that herding people occupied the desert on both sides of the Nile in Upper Egypt during Naqada I. He has further suggested that domestication had reached Khartoum by 3300 BC, using the Saheinab and the mixed local and regional elements of the excavated material as reference. According to Trigger (1965:57, 62–3) pastoralism spread south and westward from Egypt, extending through the Sahara between the 5th millennium and the end of the Neolithic wet period. Rock pictures studied by Winkler (1939) in the Eastern Desert near Thebes are interpreted to have been drawn by pastoralists. Clark (1962:15) has also maintained a possible independent African source for

the domestic long-horned cattle, as cattle are native to north Africa. Clark (1980:567) has therefore suggested that this domestication took place during environmental changes in the Sahara, forcing both people and animals closer together near the water resources. However, Trigger (1965:58) has noted it is more likely that domestication of cattle came as a result of diffusion from the Near East, rather than by independent invention. The route of diffusion is generally accepted to be through the Sinai Peninsula, during the Neolithic wet phase, when conditions were favourable for the rapid spread of a pastoral economy over large parts of north Africa (Trigger 1965:58), but others have suggested this occurred from southern Arabia and the Straits of Bab el Mandeb (Rhotert 1952). Recently, Close (2002) has suggested a diffusion route from Sinai across the Strait of Gubal with introduction to southern Egypt and northern Sudan. This thesis is based on freshly excavated material from El Qaa in southwestern Sinai, including elaborate stone tombs, which Close sees in connection with the seasonal movements of sheep/goats, and circular walls and structures at Abu Gedar, possibly used as enclosures. These sites are connected to the dispersal of domestic sheep/goats to Africa, where the Sodmein Cave in the Red Sea Hills (Vermeersch *et al.* 1994), Nabata Playa and Dakhla are important. Later sites spread to the northern part of Egypt at locations like Fayum and Merimde (Close 2002:fig. 2 and 9). Early dates of cattle in north Africa (cf. Gautier 2002) and DNA research (cf. Bradley *et al.* 1996; Bradley and Loftus 2000) may support a separate domestication in north Africa. This is also supported by Grigson (2000) who notes morphological distinctiveness of the Pharonic cattle.

Considering African evidence on pastoralism, it is also possible that the origin was concurrent in the Near East and in northeast Africa under different cultural and environmental circumstances, producing different results. One line of pastoralism occurs together with agriculture with a basis in sedentary societies in the Near East, and another line of pastoralism occurs along with hunting and gathering based on already mobile societies outside the Nile Valley. These took different paths for most of the time considered here, with meat-based pastoralism until the late 4th millennium in large parts of northeast Africa. While in the southern Levant, aspects of the specialized production were introduced at a much earlier stage during the 5th millennium BC.

It is essential to separate between the origin and development of pastoralism as part of a food-producing economy, based on the herding of animals utilized for their meat, and specialized pastoralism, which includes the utilization of milk products and wool. This could be defined as type 1 and type 2, based on Khazanov (1994) as mentioned earlier, where the former excludes cultivation and is based on meat production in combination with hunting and gathering, while the latter includes the use of agricultural products as well as the utilization of secondary products. However, it is striking that Bar-Yosef and Khazanov (1992, and others) have not really considered the implications of specialized pastoralism, which would imply that earlier nomadism could only have been based on meat production. In most cases, the discussion of early pastoralism only refers to seasonal movement of sheep and goat (cf. Köhler-Rollefson 1992:12).

There can be no doubt that the development of pastoral nomadism is closely connected to climatic changes, which make this kind of subsistence possible, together with technological and social factors. Pastoral nomadism was, in a sense, a successful development of food producing societies from fertile areas into semi-arid and arid zones, and this made it possible to exploit resources in large ecological zones. However, from an ecological point of view,

there are few possibilities for the development of a complex economy because the resources are few and scattered over large areas, but they could be utilized for longer periods of time.

Most of the theories on the origin of pastoralism have, as Cribb (1991:14) has noted, a holistic or a systemic approach, with special emphasis on the specialization and integration of nomads. Basically, there have been two lines of explanation: one which focuses on pastoralism as a consequence of the specialization and integration possible solely with the development of complex societies and, the other, where the origins of pastoralism are found in the early Neolithic. However, the issue may veer towards a differentiation of *types* of pastoralism, i.e. pastoralism based on a meat economy and specialized pastoralism based on utilizing the products of animals without killing them. Hence, it is necessary to examine specialized pastoralism, as it appears that the interplay between and occurrence of specialized pastoralism and cultivation were present at an early but different period in the southern Levant and northeast Africa.

Specialized Pastoralism: Milk, Wool and Transportation

In 1981, Sherratt published the article *Plough and Pastoralism: Aspects of the Secondary Products Revolution*, drawing attention to the secondary use of animals domesticated several millennia earlier, in addition to more recent domestications, such as the donkey and the camel. The development of new technologies also had significant impact on agricultural production, transportation, as well as the division of work between the sexes. According to Sherratt, these changes during the 4th, 3rd and 2nd millennia led to a dramatic increase in agricultural production using new methods and technologies connected to agriculture and animal husbandry. This was the first mechanization of agriculture by the introduction of the plough and later the cart, both of which made it possible to use cattle in a different manner than earlier. In addition, the domestication of the donkey, led to greater transportation possibilities. This made it feasible to utilize secondary products of animals, such milk and wool, as well as produce textiles and storable milk products continuously, without slaughtering the animals. However, none of these inventions was contemporary in time and space. This had implications for transportation, trade and personal mobility. The plough made it possible to increase the production, as well as expand cultivation into more marginal areas. The horse, donkey, camel and the cart made it possible to transport larger volumes and cover distances faster. This also had significant impact on settlement location and types, and for the first time, it was possible to exchange goods with areas that were not optimal for agriculture. The use of milk especially made large flocks of animals and better utilization of marginal areas for transhumance and pastoral nomadism sustainable. This form of pastoral nomadism is also referred to as specialized nomadism. Specialized nomadic pastoralists are, as Khazanov (1994, 2001) notes, dependent on non-pastoralists (sedentary) because their economy is not entirely self-sufficient. In the event of changes in the natural environment, nomads (transhumant) represent a flexible and dynamic subsistence pattern, where changes in the natural environment can easily be incorporated into the subsistence pattern. With reference to the types of nomads Khazanov outlined in the previous section, not all would be suitable in the timeframe here. For the 5th and 4th millennia BC, the second and third types especially would be relevant, although full or true pastoralism and sedentary animal husbandry cannot be ruled out. In a time-depth perspective, these forms must only be used as general outlines for the basic principles of economic and social organization, which each society has at present and has had in prehistory. Their unique features or traits will rarely be traced in the

archaeological record. For archaeologists though, it should be possible to trace the general elements of this time-depth perspective. Although there are minor differences between semi-sedentary pastoralism and semi-nomadic pastoralism, it is significant in this context when there are *changes* leading to more or less sedentary forms of adaptation. Processes that lead to these changes are often due to socio-cultural and/or ecological reasons. LaBianca (1990) has focused in particular on these processes of nomadization and sedentarization in later periods, as changes may be responses to environmental variation, although they may also have been a response to political events.

Sherratt's (1981) concept of the secondary products revolution has been strongly criticized, among others by Chapman (1983) who countered that the innovations were spread over several millennia. However, it was argued by Sherratt that these processes and innovations were not at all contemporary and the issue was rather the impact and consequence of the utilization of milk and wool, with reference to cultural contact and diffusion of ideas and artefacts.

Earlier models of the origin of specialized pastoralism focused on ecology, with emphasis on both population growth and the growth of herds which 'forced' part of a sedentary population to give up cultivation and instead pursue pastoral production in more marginal areas. Lees and Bates (1974) have suggested a systemic model for the development of specialized pastoralism, whereby selective pressures for mixed farming before the development of irrigation agriculture expanded into the arid zones, based on a dynamic relationship among these different groups once they were institutionalized. Lees and Bates (1974:187) proposed, therefore, a general relationship between agricultural and animal husbandry practices. Specialized pastoralism had several advantages, but it should be noted that it also needed input from the agricultural sector. Lees and Bates (1974) suggested that irrigation corresponded to the increase in crop yields, leading to a need for pastoral activities in Mesopotamia. Nomadic populations originally having a mixed economy were displaced when large-scale irrigation technology was introduced. This theory has not been used in Egypt, although Butzer (1976) has focused on the development of irrigation systems as a major precondition for the development of complex societies in Egypt. However, this is not the case in the southern Levant, as there is an absence of large-scale irrigation networks, although this might have been pursued at a smaller scale at sites such as Tell el-Mafjar and Tell el-Sultan in the Jordan Valley and Shiqmim in the Beersheba region. In the southern Levant, Levy (1983) has argued that population growth, new agricultural techniques and improved climatic conditions 'forced' a specialized pastoral population into the Negev and Sinai during the Chalcolithic period. Rosen (1988), on the other hand, draws the line back to the PPN and Neolithic periods, where specialized pastoralism is part of the evolution of the Neolithic societies and their subsistence systems.

These new ways of utilizing animals in the southern Levant, as maintained by Sherratt (1981) and later by Levy (1983:15), refer to the intensive and well-structured exploitation of secondary products, such as milk, wool, and hair of domestic animals, such as sheep and goat. In order to identify specialized pastoral production in the archaeological record, one would, as Sherratt (1981) has indicated, find changes in the composition of domesticated animals, vessels, or pottery indicating storage and processing of milk products, in addition to recovery the spindle whorls and loom weights that indicate wool production.

Levy (1983, 1992) focuses on population pressures and the need to colonize more marginal areas as a factor for the development of specialized pastoralism, in the northern Negev,

during the Chalcolithic period. Levy (1992:76) defines this type of pastoralism as 'limited village pastoralism', based on short distances from the villages. In addition, technological improvements, such as hoe-based floodwater farming, provided a catalyst for the shift from village-based pastoralism to a full transhumance system. However, he does not consider the possibility of pastoral nomadic groups (though dependent on agricultural products) operating on the fringes of settled societies for part of the season. Levy, to a large extent, focuses on the secondary products as referred to by Sherratt (1981), but he does not consider these groups to be pastoral nomadic groups—although this must clearly have been possible as there are good indications of the utilization of secondary products in the archaeological assemblages.

Gilead (1992), using much of the same material as Levy (1992), disagrees on the impact and nature of pastoralism in the southern Levant. Gilead (1992) suggests that due to the nature of their assemblages and the thickness of occupation deposits, there was a number of major sites that were settled by farmers pursuing mixed farming, such as Shiqmim and Grar. In addition, he suggests the existence of mobile herders in the vicinity of these permanent sites, like the herding stations found in Nahal Sekher, who for part of the season would leave the village and move to pastures some kilometres away. He does not rule out the possibility of nomads or semi-nomads living in the bordering regions of the northern Negev (Gilead 1992:35). This is in line with Scham's (1999) analysis of Ghassul in the Jordan Valley.

Rosen's (1988) view on the development of pastoralism already mentioned above, suggests that the evolution of agricultural systems is clearly distinct from that of pastoral nomadic systems. His view on the development of specialized pastoralism is, therefore, different from both Gilead's (1992) and Levy's (1983, 1992) theories on the same issue. Köhler-Rollefson (1992: 16) opts for pastoralism, based on the utilization of milk in the 6th millennium BC in Jordan, although there is little physical material from archaeological assemblages to support this.

Hence it seems clear, at least in the case of the southern Levant, that there are indications of pastoral nomadism during the Late Neolithic and early Chalcolithic periods (cf. Rosen 1988; Köhler-Rollefson 1989, 1992; Gilead 1992; Bar-Yosef and Khazanov 1992; Henry 1995). Plainly there are large variations in degrees of mobility and settlement pattern, although there is the basis of a mixed economy. Hunting seems to have played a minor role at larger sites, such as Ghassul, Tell el-Mafjar and Shiqmim, while both hunting and gathering presumably played a significant part in economic adaptation among the pastoral nomadic groups.

Evidence of a specialized pastoralism in the southern Levant and the impact of milking is generally based on the pottery vessels believed to represent churns, which are well known in assemblages from the Chalcolithic period. Other indications are the morphological changes of caprines during this period, which also indicate exploitation of secondary products (cf. Davis 1984). Milk and milk products would have been important products for consumption of the pastoral nomadic population, though wool and goat hair would be significant for the economy on a larger regional and interregional level, with small-scale production of either products, such as clothes and bags, or raw materials, such as wool and goat hair. This could be exchanged with sedentary groups, developing a far-reaching network of exchange as already indicated by Levy (1983), Rosen (1986), Gilead (1988, 1989), Philip and Williams-Thorpe (2000) and others. Henry (1995:372) notes that fleeced sheep in clay are dated to the 6th millennium BC in Iran, while in Egypt hairy sheep are depicted on illustrations from the 3rd millennium BC Early Dynastic periods. This relatively 'late' date in Egypt may be of great significance, as it may point toward a difference in the pastoral adaptation of large parts

of northeast Africa and the southern Levant. Henry (1995:372) suggests that the fan scraper or tabular scraper may be an indication of the exploitation of wool, as the scrapers have a temporal and spatial distribution parallel to that of caprine herding. There are ethnographic and functional studies supporting the idea that they were used for shearing sheep. Another possibility is that wool was plucked at this time.

During the 5th and 4th millennia BC in Egypt and Sudan, evidence connected to the utilization of wool, milk and related products is meagre. According to several (Crowfoot 1931; Crowfoot Payne 1993:244) there are no complete spindle whorls known from Predynastic Egypt and they are generally made of pottery or limestone. In the collection from the Ashmolean Museum, there are 17 specimens. At the Predynastic site at Maadi in Lower Egypt, 314 spindle whorls were discovered, all made in both pottery and stone and all were found in a settlement context (Rizkana and Seeher 1988:52–3, 1989:12–13). According to Rizkana and Seeher (1988:52), the average weight of the whorls lies between 30 and 70 g, but some had a weight up to 200 g. From Dynastic Egypt a number of spindle whorls, possible loom weights and reels have been connected to textile production. They have all been found in Early Dynastic contexts at Hierakonpolis, from the town and temple, but their exact provenance is uncertain (Adams 1995). Yet, this is at least a clear indication of the use of secondary products, such as wool, although they are dated to the Early Dynastic period. Zeuner (1963:178, 183ff; Sherratt 1981:282) argues that the hairy sheep may have been introduced to Egypt in the early 4th millennium BC, possibly connected to increased contacts with the east, while the woolly sheep is not introduced until the Middle Kingdom. This might, to a large degree, explain the general lack or scarcity of spindle whorls found in northeast Africa both during the 5th and 4th millennia BC. Maadi may have been connected to the utilization of wool at an earlier stage, due to its position and connection to interregional contacts, such as the southern Levant.

On the basis of similarities in shape with modern wooden vessels, Brunton and Caton-Thompson (1928:57–8) have suggested that some of the tall stone vessels from the Badarian were used to serve milk. However, such comparison is far fetched and in addition, there is no further evidence suggesting milking. Lucas (1962:330, also with reference to Breasted), although not referring to any specific period, argues that Egyptians should be acquainted with products such as milk fat and butter, as there are many texts referring to these products. However, Lucas also argues that the reference to butter must be wrong. Instead, it should be butter fat (*samn* or *ghee*), an unavoidable product in hot climates, as the fat separates from the butter. Under any circumstances, the texts state that they had the knowledge of secondary products, although the dates for this source are uncertain. Of a much more secure date, however, are two alabaster jars containing cheese from Saqqara, dated to the First Dynasty (Lucas 1962:330; cf. also Simoons 1971:434).

Sadr (2002) has suggested that the pastoralism of central Sudan was episodic throughout several millennia, though he does not consider specialized pastoralism and its implications for the archaeological record. In the Khartoum, Neolithic domestic cattle and ovicaprids are present (cf. Arkell 1953; Haaland 1978; Caneva 1988 and others), and in the light of the spread of pastoralism in Africa, these domestic animals would have been introduced from the north (Smith 1992a, 1992b). Sadr (2002:474) suggests that during the Khartoum Neolithic, there is a gradual northward shift of herding as part of an episodic adaptation. Further, domestic plants are more or less absent (Sadr 2002:472), which points in the direction of hunting, fishing and gathering as important modes of subsistence. In the faunal remains, the percentages of

cattle bones vary a great deal (cf. Sadr 2002, with references). As already mentioned, Haaland (1981, 1987) has suggested that groups along the Nile Valley could rely on the production of food grains on the fertile alluvium, in addition to the utilization of the more marginal environment from the river as pasture during the Khartoum Neolithic. In other words, this indicates seasonal activities away from the Nile Valley itself, distinguishing societies with mixed economies, based on both cultivation and pastoralism, combined with fishing and gathering. This is established on the differences of faunal composition of the sites. Haaland (1984) then suggests an increased focus on livestock, which have different properties compared to land and agriculture. Animals being regarded as capital investment do have implications on the social organization. The sites with domesticated animals are small non-permanent sites and the political organization of nomads may indeed explain why groups with a multi-resource adaptation were displaced. One of the few people considering the implications of *specialized* pastoralism in northeast Africa, Haaland (1991, 1992) expressed a further development of this. Haaland (1992:47, 54) suggests that specialized pastoralism developed in the eastern Sahara after *ca.* 4000 BC. This is based on Libyan rock art and the fact that there is a number of hearths dated between 3800–3000 BC, suggesting that these are the remains of specialized cattle herders (Gabriel 1987). This specialization spread to Central Sudan some time after 3300 BC (Haaland 1991:152; 1992:47), theorized on the presence of domesticated livestock at a number of sites in the central Nile Valley. These are the remains of an expansion of specialized pastoralists from eastern Sahara, with no basis on the local adaptation of a mixed economy of fishing, pastoralism and agriculture. This led to a resource competition of pastoral resources between those who were specialized pastoral nomads coming into the region and the local multi-resource adaptation (Haaland 1991, 1992). After the Late Neolithic in the Sudan, there is scarce evidence until the Kingdom of Kush (cf. Haaland 1984), which has generally been regarded as a change towards pastoral nomadism (Haaland 1981; Caneva 1991 and others).

The main problem of specialized pastoralism during the 5th and 4th millennia must have been on the level of transportation. Sheep and goats may only carry small loads and would not be suitable in large exchange systems. It must be noted, however, that the exchange during this period must have been slow and irregular like a kind of trickle trade. Levy (1992:69, with reference to Davis 1976) argues that donkeys seem to have been domesticated in the late 5th to the early 4th millennia BC, but are only found in small quantities during the Chalcolithic and Early Bronze Age periods. During the Chalcolithic, the donkey was present on a number of Chalcolithic sites, though not in substantial numbers, suggesting use as pack animals rather than as a food source (Ovadia 1992:24). At Ghassul, Scham (1999:491, fig. 3.17) argues that donkeys appear on 3% of the painted shreds and the bone material also indicates remains of equids. Whether these bones originate from donkeys remains unclear, but if this is the case, it would be at a very early date. In addition, there is, during the Chalcolithic and EB I, a number of figurines suggesting donkeys or asses from Ein Gedi, Gilat, Ghassul, Azor, Bat Yam and Giv'atayim, several carrying large containers on each side (cf. Epstein 1985b; Ovidia 1992). Interestingly enough, many of these are also connected to churns and cornets, as the one from Gilat. The donkey is the domesticated descendant of the wild ass, which inhabited both the African and Near Eastern deserts (Ovadia 1992:19). Clutton-Brock (1989:91) argues it was probably domesticated in this region, or possibly Egypt, while Ovadia (1992:20) suggests Israel as a likely alternative, as one of the first places to adopt the innovation of domesticated donkeys. Ovadia (1992:20) contends that domestic asses are minimally present at a number

of Chalcolithic sites in the southern Levant, although they were rare, but the EB I material is more numerous and more obvious. It is striking that the picture is not as plain for northeast Africa, although donkey has been found at Maadi in Lower Egypt. Again, it is tempting to see Maadi as part of the southern Levant complex, with reference to adaptation, economy and connections. However, there is also the possibility that sheep may have been used as pack animals during large parts of the late 5th and 4th millennia, as they were already domesticated and the evidence of the donkey is dated to the late 4th millennium. It is acknowledged that sheep are used as pack animals in the Tibetan Himalayas (cf. Khazanov 1994:66). Camels are not evident in the material, becoming domesticated much later, and the riding horse is not significant for the region analysed here. However, specialized pastoralism would, according to Bar-Yosef and Khazanov (1992:5), by itself provide all their immediate requirements, suggesting that agricultural products must have been part of the exchange system, as well as other long-lasting objects, such as pottery, metal objects and seashells.

Both Khazanov (1994) and Rosen (1988) suggest that the emergence of state societies and interregional contacts provided an opportunity for the development of specialized pastoralism. This is based on the idea that this development had its origins in a mixed economy, i.e. a mixed economy based on both pastoralism and agriculture, which developed into two different groups—one pursuing specialized pastoralism and the other agriculture. Sadr (1991:8–9) has suggested that many of these theories are too specific and that there is a need to ask what encourages a large symbiotic system to turn into an interregional symbiotic system. Increased organization, administration, economic opportunities and the widening of networks of products and information and the development of the technologically more complex societies were the main factors for this development of specialized pastoralism. On an organizational level, Sadr (1991:9) suggests something resembling a chiefdom, which is less hierarchical and has a smaller geographic and demographic base than a state, although more complex than a tribe. Therefore, Sadr (1991:9–11) suggests that nomadism developed in a context of increased and growing social, economic and political complexity. However, as it is argued here, the roots of this do not lie on the eve of complex societies in the late 4th millennium, but in the gradually developing interregional networks of products and information in the preceding two millennia.

Animal Representations

The clay animal figurines, as seen at Tell el-Mafjar, Ghassul, Nahal Mishmar and other sites, may clearly be indications of items symbolically related to pastoralism. At Ghassul, at least one clay animal figurine with horns (Hennessy 1969; Fig. 11.5 and 11.6) is similar to one of the figurines from Tell el-Mafjar. Both Scham (1999) and Elliot (1978:48, Fig.6) mention bowls of pottery with horned animals on the rim, also bearing similarities to Nahal Mishmar and the crown with horned animals. From Ghassul, there are also several sherds with applied animal heads and horned animal figures on the rim (cf. Koeppel 1940; Elliot 1978; Scham 1999). Whether these animals represent domesticates, such as goats or sheep, is, to a large degree, a matter of interpretation. However, Scham (1999) seems to favour this as a reflection of extended emphasis on pastoral animals at Ghassul. Animal figurines are also known from sites such as Maadi, although these seem to be different from the ones known in the southern Levant. No less than three heads are interpreted as animal figurines and two of these are decorated with dark red lines on a light slip and have been interpreted as cows,

or donkeys (Rizkana and Seeher 1989:11). From an uncertain context at Tell el-Farah (N), two copper animal figurines have been tentatively dated to EB I, on a stylistic basis (Amiran 1986), though they may be seen as a continued emphasis on pastoral animals.

While there seems to be an emphasis on sheep/goat in the southern Levant and the sites in the Nile Delta, cattle seems to be the focus in northeast Africa. Wengrow (2001) has recently pointed to widespread expression through cattle in both Sudan and Egypt. He argues that these were elements of earlier times that were elaborated and incorporated into the early Dynastic periods stressing the human-animal relation. This is based on the cattle burials (such as Nabta Playa and Badarian graves) as well as down to Central Sudan, the Narmer Palette and other palettes, clay models of cattle from El-Amrah, Naqada I pottery with depictions of cattle, paintings of cattle in burials at Hierakonpolis and the cattle burials at Qustul.

In this context the animals, whether sheep/goat as in the Levant or cattle in northeast Africa, were connected to a new pastoral lifestyle, where these animals had to be incorporated into a wider social and ritual setting stressing the values and abilities of these animals. In the Egyptian context this may be followed further in the formation of the Dynastic period (cf. Frankfort 1948, 1956; Wengrow 2001). This may also be supported with the idea that these images focus on a context where these animals are representing *new* and important factors in the economy, as well as in a symbolic sphere (e.g. Hodder 1982b; Wylie 1982).

Compounds or Corrals

Compounds or corrals are found over a large area, and particularly in the arid regions of Syria, Saudi Arabia and the southern Levant. In Sinai, several sites have been dated to the late Chalcolithic period by Rothenberg (1979) and recently, more have been discovered in the central parts of the peninsula, including circular villages, temporal camps and open-air sanctuaries, dated to the Chalcolithic and Early Bronze Age periods. This is a clear indication of pastoral economies existing in the Sinai Peninsula (Eddy and Wendorf 1999). Some of these have been interpreted as compound enclosures or pens for sheep and goats, as the animals were kept for their by-products, such as milk and wool (Eddy and Wendorf 1999:135). One such site (Sinai-1) was interpreted as being repeatedly and briefly occupied by pastoralists for an extended period of time (Duncan 1999:170–1). Other sites have been found, such as S-25, interpreted as buried midden and connected to pastoralism with artefacts dated to the Chalcolithic and Early Bronze Age. Here, the walls are interpreted as stock-holding pens with midden stringers of burned animal dung, together with the bones of sheep/goats and possibly cows (Eddy 1999:210–20). Similar sites have been found in the Jordanian Desert (cf. Henry 1995) and other places in the region (see Fig. 5.4) and will be discussed further below.

Rock Art

Although rock art is both difficult to date and sometimes also difficult to identify, it has been used as an argument for the evidence of pastoral nomadic groups, especially in northeast Africa (cf. Haaland 1991, 1992).

In the Eastern Desert near Thebes, Winkler (1939) studied rock art, which appeared to have been drawn by pastoralists, possibly from the Predynastic period, as cows are portrayed with deformed horns and prominent udders. At Gilf Kebir and Gebel Unweiat in Egypt there are both engravings and paintings of cattle. Consistent with Smith, this and other sites support the idea that pastoral groups were in the region around 5000 BC. The paintings are

Figure 5.4 A corral or pen in the Jebel Bishri region of Syria, courtesy of SYSGIS, Minna Lönnqvist. (photo Nils Anfinset).

interpreted as depicting domestic cattle, but also possibly indicating different groups by the colour and the attributes of the people pictured. Smith (1992a:130) also suggests that the evidence of skin garments in graves at Adar Bous may indicate a pastoral population. The numerous examples of rock art across the Sahara with depictions of giraffes, elephants, rhinos and cattle clearly suggest that a different climate prevailed in certain periods. In particular, some of the rock art illustrates milking scenes, such as the ones from Acacus Fezzan in Libya and Tassili-n-Ajjer in Algeria (Lhote 1963; Simoons 1971, fig. 4, 5 and 6 in Haaland 1992). Although the date is uncertain, it certainly illustrates the possibility of pastoralism in the region, as well as its importance. Recently, Holl (2004) has given a list of tested archaeological sites in Tassili-n-Ajjer, where the majority of the radiocarbon dates seem to fall within the 3rd and 2nd millennia BC. Lhote (1963:12) suggests a date between 3500 and 2500 BC for Tassili. Trigger (1965:64, with reference to Winkler 1939 and Murray 1951) has argued that the rock paintings in the Gilf Kebir and Uweinat Hills of Nubia indicate that cattle herding continued in these areas, down to the final period of the Neolithic wet phase. More recently, Muzzolini (1992) has also argued that the earliest rock art in Central Sahara fits relatively well with the Neolithic Humid Phase. Under any circumstances, there seems to be great emphasis on cattle in rock art representations in large parts of northeast Africa, while the picture is less obvious in the southern Levant. Inscriptions and rock carvings of cattle, along with other animals, are known from Jawa in Jordan (cf. Helms 1991a:168–74, fig. 205–13), possibly suggesting that cattle were bred and reared in the greater region in the 4th millennium BC.

Desert Kites

Another category of sites, which are only known in the southern Levant, are the so-called desert kites. These have all been found in the arid regions of Jordan, Negev, Sinai, Jordan and Saudi Arabia and have generally been ascribed as hunting installations on the basis of shape, location and arrowheads (cf. Finkelstein and Perevolotsky 1990:69; Betts 1991b). However, the function and the appropriate shape of these are uncertain and it is questionable if they may be connected to pastoral nomadism. Several have provisionally been dated to the

4th millennium. One possibility is that these may reflect an additional and supplementary economy and diet of pastoral nomads living in the region, or sedentary hunting groups, though the latter may not be likely, as arrowheads are relatively rare at larger sites believed to reflect a sedentary occupation.

The Nawamis of Sinai

The Nawamis were first recorded by travellers in the 19th century, and are the first evidence of burials in the arid zones of the southern Levant. At present, 21 groups of Nawamis have been recorded in similar locations in a belt around the high mountains in the vicinity of the monastery of St Catherine (Finklestein 1995:19, with references). Finkelstein (1995:19) has suggested that they were built by pastoral nomads, where the Nawamis functioned as possible tribal cemeteries. The Nawamis of Sinai are generally lacking sedentary and agricultural remains (Bar-Yosef *et al.* 1986). Oren and Gilead (1981) suggest that pastoralists coming from the Nahal Besor region in the Negev to northeast Sinai used them while the southern Sinai inhabitants had closer relations to Predynastic Egypt. Sinai had pastures for sheep and goats and Bar-Yosef (*et al.* 1986) has suggested that it may have been inhabited by people with a separate or distinct herding economy, having little contact with sedentary groups. Herding or pastoral nomadic groups operating in the Sinai Peninsula during the 5th and 4th millennia BC, fit well with the improved climatic conditions, making this adaptation possible. Horowitz (1976) has suggested that, based on pollen analysis, there are indications of a climate with higher humidity and increased rainfall than today during the Atlantic period 5000–2500 BC. This corresponds well for the new and numerous sites in both Negev and Sinai. Again, the improved weather conditions are consistent with Butzer's (1976) analysis of northeast Africa, although he argues that this wet phase is more limited in the southern Levant. Higher humidity and rainfall in the southern Levant during the 5th and 4th millennia BC also fit with the results of Bintleff (1982), indicating the same tendencies.

A significant point is that the people who used the nawamis as tombs knew about copper because copper artefacts have been found in the tombs. However, there is no indirect evidence of copper production and smelting as Ilan and Sebbane (1989:153) suggest. The dating of the Nawamis is problematic as there is a lack of chronological and typological material that may connect these tombs to a larger cultural setting and chronological framework. Bar-Yosef (*et al.* 1977, 1983:56) has on the basis of lithic material, shells and beads, dated the Nawamis to the late 4th millennium BC. According to Ilan and Sebbane (1989:153), the copper awls support this dating, as the awls sections are squared and should therefore fall within the EB I to the north. They further suggest that the awls found in these Nawamis are made of copper from the mines in southern Sinai, although there is no clear evidence for this, and at the best, the evidence is only circumstantial. Bar-Yosef (*et al.* 1983:58) suggests that the inhabitants of southern Sinai may have traded copper with both the southern Levant and Egypt. These issues on copper will be returned to in the next chapter.

Pastoral Nomadic Sites or Groups on the Fringes?

The Southern Levant

There is a growing conviction that nomads existed in the southern Levant, during the 5th and 4th millennia, both in the Black Desert of Jordan (Betts 1991a, 1992, 1997), contemporary with the settled Chalcolithic societies, as well as in central Negev (Forenbaher 1997). Although

there are great methodological problems connected with the identification of nomads in the archaeological record, there is little doubt that they existed.

Rosen (1988) has noted that sites from the late Neolithic and Chalcolithic periods are underrepresented in Negev and Sinai, compared to both earlier and later periods, suggesting a possible demographic decline in the region. However, one site, Kvish Harif, dated to *ca.* 4100 BC, has similarities in lithic material to the preceding periods, though the architecture, defined as pen/courtyard structures, bears more resemblance to the later Early Bronze Age sites in the region. Although bones of sheep/goat were found, it is uncertain if they were domesticated (Rosen 1988:501). Rosen suggests further that from the mid 4th millennium onwards, there is a marked change whereby hunting in the region decreased and the presence of domesticates increased. In addition, the presence of sickle segments is noted at virtually all sites in the Negev, grinding stones are present at most sites and a large central courtyard with attached rooms is found at some sites (Rosen 1988:501).

Recently Henry (1995) has identified what he defines as the Timnian Complex on the basis of major material differences from the settled sites in the Beersheba region and the Jordan Valley. It consists of small ephemeral hamlets and seasonal camps in the Sinai desert, in the Judayid Basin and the adjacent mountains in southern Jordan. He suggests that pastoral nomadism was a region-wide adaptation across the arid zone of the Levant during the Chalcolithic. This resembles much of the modern Bedouin pattern with large long-term seasonal camps during the winter and smaller mobile camps during the dry season (Henry 1995:355). Henry (1995:356) also notes a clear difference in the altitude, as the larger camps are located between 1100–1250 masl, while the ephemeral camps are located from just under 800–1500 masl, although most of these sites were located in the lowlands on the wadi floor. The ephemeral camps had very shallow deposits, usually less than 20 cm, in contrast to the long-term camps, which had deposits between 80–110 cm, in addition to stone-lined hearths, thick ash beds and architecture (Henry 1995:358). One of these short-term sites was Jebel el Jill (J14), located at 1200 masl, and having a locus interpreted as a corral with thin cultural deposits and another locus interpreted as a semi-subterranean pit-house with lined stone. The latter included a fire pit, several grinding stones, chert bone and pottery, and the alternating ash lenses separated by sand have been interpreted as episodes of abandonment (Henry 1995:359). From the pit-house, ten worked bone points were discovered together with nine ground stone specimens of coarse-grained sandstone (Henry 1995:365–6). Sherds of holemouth and short neck jars of middle to large size were also discovered, vessels which were most probably used as storage containers (Henry 1995:367–8). Most of the shell, all of which were species from the Red Sea, had been holed or cut into beads (Henry 1995:368). The faunal material represented 74% caprines and 24% gazelle bones, but it is unclear if the caprines were domesticated or not, though Henry (1995:369) assumes that the bones represent herded sheep/goat on the basis of the prevalence of domesticated caprines at the beginning of the Neolithic. What is important is that there is a relatively high percentage of remains from wild animals that without a doubt suggest hunting to be quite essential, differing from the larger permanent sites where hunting seems to be of lesser importance (cf. Grigson 1987). Another site, Jebel Queisa (J24), located at 1200 masl, was only test excavated and dated to 5720 ± 149 BP. It revealed remnants of stone walls and a high concentration of artefacts (Henry 1995:361). This and similar long-term sites yielded stone tools, ground stone, pottery, worked bone and ornamental shell specimens. The lithic tools consisted of

end scrapers and tabular scrapers, burins, microlithis, retouched pieces and arrowheads (Henry 1995:362–5). On the basis of the excavations and surveys in southern Jordan, Henry (1995) argues that these sites represent mobile groups which herded caprines in addition to hunting and gathering. They moved between different altitudes, taking advantage of available resources, where group size depended on the resources available. Wheat and barley were only present at three sites from the Chalcolithic period, and the absence of sickle blades has led Henry (1995) to suggest that these pastoral nomadic groups were not engaged in cereal cultivation. However, it does not rule out contact with a sedentary agricultural population. Although the evidence of the larger sites could have been more substantial, the indications of presence or absence of architecture is worth considering. Henry clearly demonstrates that the hamlet was curvilinear in form, comprised of unhewn stone pit-houses, corrals, retaining walls and storage pits. Pottery and grinding stones represent pastoral nomads, although these are not generally considered to be the 'basic' indicators of mobile populations. However, they are certainly indicators of partial residential permanency. Here, as Sadr (1991) has suggested for northeast Africa, it is important to also consider the faunal and environmental data, in addition to a larger regional setting. The semi-subterranean structures with internal hearths have similarities both to sites in the Beersheba region and Lower Egypt, and are thought to be designed for preserving heat, as well as moist conditions during the winter season.

In 1976 a small Chalcolithic site in Wâdi Araba was discovered and excavated. A number of hearths, grinding stones, flint tools and pottery sherds were typologically dated to the Chalcolithic period (Beit-Arieh and Gophna 1976). Some of the pottery fragments pointed to the possibility of large jars. The flint material consisted of adzes, scrapers of tabular flint, sickle blades and borers. The overall impression was that the material represented a temporary encampment, close to the water resources of Ain Marzab and Ain el-Hoferah. No copper ore or artefacts were discovered at the site. 'However, it may be argued that the very existence of Chalcolithic remains indicate that the site was occupied by a people searching for copper resources in the area' (Beit-Arieh and Gophna 1976:106). Although there are no indications that the people using the site were actually searching for copper, one may see this site in a socio-economic context, where the site represents the utilization of a broader environment and resources, possibly pastoral nomadism. This interpretation of the site may be supported by a wide range of hearths in the vicinity of freshwater springs, although there are no structural features found. However, certain elements such as grinding stones and large storage jars are certainly items a pastoral nomadic way of life would not allow. These objects may have been left on site, to be frequently reused during seasonal migrations. Thus, a pastoral nomadic interpretation of the site should not be ruled out. In any case, the material discovered at the site also implies influence or contact with the sedentary societies of the Beersheba region and the Lower Jordan Valley.

In 1974 a unique Chalcolithic site (no.1105) was located in the southern Sinai along Wadi Hasif on a low terrace, between the foot of Mt Serabit el-Khâdim and the sand dunes (Beit-Arieh 1980). Excavations produced flint, pottery, stone implements and three structural features *ca.* 50 m apart and several stone lines. Structure A was a 5–6 m long wall with a possible wooden roof structure, as there was one stone block in the centre which may have functioned as a base. The structure resembles EBA II structures known in southern Sinai that also have the central pillar (Beit-Arieh and Gophna 1976:48). Structure B was elliptical in shape, but partly destroyed by floodwater in a shallow ravine. On the southeastern side

along the wall, there was a circular compartment with only patches of the floor left (Beit-Arieh and Gophna 1976:48–9). Structure C, constructed like B, was possibly oval in shape. Structures B and C do not have any particular parallels, but resemble the Nawamis used as tombs in the 4th millennium (Beit-Arieh and Gophna 1976:49 in Bar-Yosef *et al.* 1977:67–70). The general interpretation is that the structures are more or less contemporary due to similar constructions and the homogeneous material. Structure A is interpreted as a working area, while B and C are interpreted as dwelling areas (Beit-Arieh and Gophna 1976:49). In addition, there were seven circular or rectangular pits in close vicinity on the site. Pottery of later date with similarities to both Egypt and the southern Levant was also found, but these are late vessels and are not contemporary with the main Chalcolithic assemblage at the site according to the excavators. Structure A included lug handles of juglets and jugs (one with finger impressions cf. Ghassul and Beersheba), flat based jars (cf. Ghassul, Bir es-Safadi and Arad Stratum V), and bowl rims (cf. Ghassul, Beersheba and Arad). The flint material was numerous, mostly blades with triangular or trapezoid cross-sections, mainly found on the floors of Structure A and B and known as Canaanite blades recognized from the Chalcolithic and EB. The blades all had blunted points and were smoothed and polished from extensive use. In addition, there were chips and cores and a few bladelets and awls, but few other tools. The excavators interpret the site as being connected to the mining of turquoise, where the final step included using the blades. Several chips of unworked turquoise were found near and inside of structure A and several flat stone tablets with grooves and particles of turquoise still adhering were also found (Beit-Arieh and Gophna 1976:56). An additional 30 stone hammers of haematite were found comprising three different types. Six of these were found *in situ*, and chips of haematite were found around structure A, indicating that they were made on the spot, along with fragments of grinding stones. In structure A, two axes were also found, one of haematite and one of sandstone, together with one ring of a mace-head of black diorite (disc) with a central biconical hole. Charred beams of structure A were of acacia and Euphrates population, both of which require large quantities of water to thrive (Beit-Arieh and Gophna 1976:60). The animal bones in structure A were fragments of goat or sheep, in addition to one large fragment of *Bos taurus* (cow). The excavators conclude that the Chalcolithic-Ghassulian site at the foot of Serabit el-Khadim was a small settlement or site with both ordinary and special purpose occupation, probably by miners from Egypt. However, as there is no mining activity in Sinai before the beginning of the Third Dynasty, and one 'must assume that prior to this time the population of that region of Sinai consisted of other ethnic elements who mined, polished and perhaps also transported the turquoise to Egypt. ... The Ghassulinan site near Serabit el-Khadim is the earliest evidence to date of turquoise mining by a Palestinian population that settled in Sinai' (Beit-Arieh 1980:61). Beit-Arieh (1980:61) further argues there are similarities in material culture, with both Egypt and the Chalcolithic of the Levant in art and technology, but there are no connecting elements with the centres of the Ghassulian culture of the Negev. Beit-Arieh and Gophna (1976; Beit-Arieh 1980:62) see this as a gradual process of a relocation of people, where one would expect to find a string of settlements along the migration route, as they must have had connection to some centres, possibly the Ghassulian/Chalcolithic culture, as they penetrated into Sinai and the Arawah searching for metal and luxury goods. The fact that the awls of the Nawamis of Sinai are related to a grave context may both be a link towards a nomadic adaptation and the link towards the northeast African region and especially the Nubia. The awls are not common

in the grave contexts of the southern Levant, and may indicate a different cultural attitude both towards copper in general and the copper awl specifically, but this will be addressed in the next chapter. However, it is significant that this area stands out as the link between societies in Egypt and the southern Levant with relatively clear pastoral-nomadic indications.

The Nubian A-Group: Pastoral Nomadic or a Settled Society?

As mentioned earlier in relation to Egypt and the southern Levant, the issue of a pastoral nomadic or a settled society is also closely connected to whether the utilization of animals was *specialized* or not. As with the case of the Nubian A-Group, one would have a totally different economic basis, if the secondary products were not utilized. This, of course, does not rule out the possibility of using leather for clothing, etc. However, as mentioned previously, exploitation of animals and their secondary products opens up new areas to be used, as well as creating mobile groups over large distances, which in turn leads to a broadening of the contact base. With reference to the Nubian A-Group, as with the Predynastic Egypt, it is striking that the use of secondary products has not even been considered. Much of the discussion of the Nubian A-Group has centred on the theme of whether the animals were domestic or not, and if they were domestic—to what degree was the Nubian A-Group a nomadic society.

Several researchers have suggested that the early Nubian societies were based on mixed agriculture (cf. Sadr 1991), similar to that in Upper Egypt, though the Nubian was poorer due to the natural environment. Firth (1915) has stressed the pastoral aspect and suggested that the Nubians were more similar to the Saharan groups than to those of Egypt. Trigger (1965:68) casts doubt on the pastoral aspect, as the results from the Indian expedition to Nubia recovered wheat and barley from the excavation, pointing in direction of dependency on agriculture. However, as pointed out in earlier sections on pastoral nomads, they are almost always also depending on agricultural products. Trigger argues that, 'if the Nubians had relied predominantly on pastoralism, the ecology on Nubia is such that they would have had to grow or gather food during the low water to feed their cattle during the flood season, when almost all the grazing land would be under water' (Trigger 1965:68). However, this does not take into consideration the length of the Neolithic wet phase, and the fact that there could still be areas outside the Nile Valley suitable for pastoralism. From later textual sources, the Egyptians listed both cattle and goats as booty from Nubia. Trigger does not seem to be confident with purely an agricultural society either, as he concludes with: 'The Nubians were probably dependent primarily on cattle at this time but, like many of the Nilotic tribes, managed to grow crops as well' (Trigger 1965:68).

Few definite contexts of the A-Group have revealed domesticated animals. There are a few indications of goat or sheep and cattle, although the evidence is poor. Cowhide has been found in A-Group context (both from Classic and Terminal A-Group), pottery is tempered with Nile mud and cattle dung, and may indicate the significant economic role of cattle (Nordström 1972:24), and rock drawings in the central and eastern Sahara (Rhotert 1952; Lhote 1961) and Eastern Desert (Winkler 1939), may indicate cattle nomadism as discussed earlier. The subsistence pattern clearly indicates agriculture and pastoralism with remains of wheat, barley, and leguminous plants, dates, bones of sheep, goats and cattle. According to Trigger (1976:35), sheep and goats were of greater importance than cattle, while cattle were herded in the Red Sea Hills. At Khor Bahan it is not certain to what degree agriculture and animal husbandry played a significant part in the economy, although bones of cattle and goats

were found (Reisner 1910:115–16). According to Trigger (1965:68), this would correspond to the picture of pastoralism spreading to the area of Khartoum around 3300 BC. There are arguments (Nordström 1972:24) that cattle raising may have been introduced as a result of ecological changes in eastern Sahara and a stage of aridity *ca.* 5500–5000 BP. The site AS 6-G-25 has yielded evidence of domesticated goat bones; whether the site is Terminal Abkan or early A-Group is uncertain, but it still gives a fairly early date (Perkins 1965:56–61; Nordström 1972:16). The storage pit complex at Khôr Daud in Lower Nubia has also been taken for evidence of pastoralism, as it has been interpreted as an exchange point as mentioned earlier.

The plant material basically relies on material from Afiya, but it is generally accepted that both emmer wheat and barley were cultivated species (Rampersad 1999:160–1). Grains in burials is not uncommon (Nordström 1972), and Rampersad (1999:161) suggests that it may have had a ritualistic function in grave contexts. At Afiya, there was also evidence of grinders, mortars and sickle blades with sheen (Lal 1967), pointing in the direction of agriculture, although they may have also been used for wild species.

Remains of game, at the habitation sites and in graves, also indicate contact with a varied steppe or savannah fauna. This is also seen in rock drawings of elephants, giraffes and antelopes—although the dating of these is a matter of discussion—as well as ostrich eggshells, tortoise shell and ivory as personal adornment found in graves. There are also skeletal materials of crocodile, antelope, gazelle, hippopotamus found in graves indicating possible hunting (Rampersad 1999:168–9, with references).

Trigger (1965:19) has argued that Lower Nubia does not produce enough food for its inhabitants, and it is likely this was also the case in the 4th millennium—people were dependent on creating a surplus and on commodities in order to exchange goods for food and other consumables. This is, of course, based on the assumption that there is a population increase, or that the production of food is less than what is needed. This would be the case in a period of growing interaction with Egypt and the development of small commercial centres based on long-distance trade, also promoting an increased division of labour. As with the population of Nubia, it was broken up into local groups occupying areas or pockets of arable land in the early 20th century. The region is unsuitable for large-scale irrigation but on the other hand it is suitable to small-scale farming based on small landholdings, privately owned and independently worked, creating a pattern of self-reliant and independent farmers with a stable population and restricted potential for development (Trigger 1965:22). However, at the eve of large-scale irrigation and farming in both Upper and Lower Egypt during the Predynastic period, this probably generated a situation in Lower Nubia where demands of certain goods and consumables went beyond the 'normal' demands, thus creating a new situation where the area of Lower Nubia was in the middle.

Adams (1977:123) has suggested that the Nubians were gradually settling down with continuity in the development of society and economy that had started in the Neolithic. He argues on the basis of Trigger's data that large settlements probably did not number as many as 100, and there is no evidence of large communities. The few settlement or dwelling places rather have the nature of being seasonal or temporary camps, and not much different from the Mesolithic and Neolithic campsites. This is also seen in the grinding stones, and other lithic material which shows a tradition from the Mesolithic and Neolithic, although grinding stones, etc. appear in the A-Group in larger quantity than earlier. Of the 40 or so settlement sites, only three exhibit clear structural remains (Adams 1977:124).

The subsistence pattern of the A-Group is much disputed, but evidence of cattle-dung in the pottery, as pointed out by Nordström (1972), cannot be neglected, in addition to the recent finds in the Western Desert (Lange 2000). This, together with other small satellite sites mentioned by Trigger (1965), should point in the direction of pastoral nomadism. Sadr's argument of large cemeteries and double burials as evidence of a relatively sedentary society is not very convincing (Sadr 1991:89). O'Connor suggests that the semi-deserts flanking Nubia were different from Egypt, and made it possible to support a substantial nomadic population in Lower Nubia (O'Connor 1993:xii). Further, O'Connor (1993:10) assumes, regardless of the organizational aspect (chiefdom or state), that the early Nubian societies had ideologies and organizational systems different from what we find in Predynastic Egypt, and suggests that Nubia and Egypt had different social and political systems. 'Nubia as a whole was certainly varied in material culture and could not have formed a political unity' (O'Connor 1993:10). However, O'Connor (1993:14) dismissed the theory of the A-Group as a simple small-scale political system, where at least in the later A-Group, a high degree of social complexity and political centralization occurred. O'Connor (1993:15) suggests that the A-Group was usually sedentary farmers practising flood-irrigation agriculture and raising substantial animal herds. They were self-sufficient in food, due to a wealthy elite who had monopolized trade, and it is their cemeteries that have been excavated. O'Connor further suggests that, 'In later A-Group times sizable towns of mud-bricks, fortified with a town wall could have existed' (O'Connor 1993:15). However, it is rather doubtful if this occurred in Lower Nubia during the 4th millennium and the actual evidence of this is rather sparse. There is not much evidence of specialization such as administrators, priests, soldiers or artisans. The social complexity of the Nubian A-Group may have taken place on a totally different scale, in terms of adaptability to the environment and the changing social and economic circumstances with Upper Egypt, which made the A-Group a sustainable society. Although rich priestly or prince-like graves occur in the A-Group, they do not occur until the final stage of the A-Group, the terminal phase, which lasted for only around 200 years (such as Cemetery L at Qustul and Sayala). O'Connor (1993:16 ff) here uses the Cemeteries 277 and 401 excavated by the Scandinavian Joint Expedition to illustrate the social complexity and the social and economic differentiation exhibited in the grave burials. Though the three richest graves on Cemetery 277 are females, it is not discussed whether these were political leaders or what role they had in a large social setting. This was also the case in Cemetery 401, where the two richest burials were women. O'Connor (1993:15–16) rather suggests that poor people were buried somewhere else. Moreover, O'Connor (1993:18) argues that there were at least four socio-economic levels in the A-Group community, although the material evidence and theories on the issue are totally lacking. Other evidence to support the pastoral nomadic nature of the Nubian A-Group is the impressive cattle burials at Qustul (cf. Williams 1986).

The subsistence pattern clearly points towards both agriculture and pastoralism. The exploitation of sheep, goats and cattle in the A-Group may well be indications of meat production rather than exploitation of their secondary products, which is not evident in the material. This follows Sadr's (1991:90) argument that it still remains an open question whether the A-Group had a pastoral *production* or not. However, what is clear from the studies of Trigger (1965) and Nordström (1972) is that there is a gradual increase in sites and cemeteries, probably indicating a population growth during the 4th millennium, culminating during the last centuries around 3000 BC or shortly after, which also led to increased sedentism,

combined with the increased contacts and exchange with both Egypt in the north and regions to the south, east and west. The cemeteries and sites along the Nile may rather be seen as seasonal aggregation sites, not uncommon to the modern pastoral nomads of northeast Africa and the Middle East. This may also explain why there are so few settlement sites. Through these seasonal movements, some must have seen the opportunities and possibilities of accumulating wealth through trade and exchange with other groups both in the east, west, north and south. This may also be supported by Sadr's (1991) study which demonstrates that there are important pastoral groups on the periphery of the Predynastic and Dynastic periods of Egypt. In a larger interregional perspective, these processes will be taken up again in Chapter 8.

Villages, Nomads and Developing Urban Centres

> It should be known that differences of conditions among people are the result of the different ways in which they make their living. Social organization enables them to co-operate toward that end and to start with the simple necessities of life, before they get to conveniences and luxuries (Khaldûn 1989:91).

Barth has formulated that the basic pattern in the Middle East might be sketched as follows: 'On the domestic level, within local areas, an income flow tends to be set up from agricultural units to pastoral units, sustaining local dominance by the pastoralists. However, cities with their urban elites, controlling the state apparatus, also prey on the cultivating households, and they do so by very effective and stable force and control, making peasants of the cultivators and drawing a substantial tax flow from them. Through this there is a tendency for the peasant households to be ground down even further by debt burdens to middleman entrepreneurs' (Barth 1973:17–18). In a Predynastic and pre-urban perspective, the same processes seem to have been at work, though at a lower scale of social complexity. The settled societies would have difficulties in controlling and dominating pastoral groups operating on their fringes or peripheries and these groups could easily disrupt economic and political stability (cf. Trigger 1985). However, on the other hand, the pastoral groups would not be unaffected by these settled societies and would be drawn into a wider system of stratification within a large region.

For centuries and even millennia, societies of the Middle East have probably been divided into three different types of community: nomads, settled cultivators and townspeople (cf. Khaldûn 1989; Sadr 1991; Anderson 2000; Eickelman 2002). These different modes of living are often contrasted and seen as separate or individual social organizations, although there is great interrelationship between the three. This may easily be seen as a relatively modern construction, and perhaps it is, but there are in this division elements of great antiquity. Obviously, there is no direct link between these modern societies and a prehistoric division of societies, but it is well known that all these three groups are found in the Middle East, at least as early as the late 4th millennium BC. The present nomads of the Middle East have undergone rapid changes over the last decade, and though these new changes have little actual relevance here, they have relevance on a general level—how societies and, in this case pastoral nomads, change and adapt to new features which affect their way of living and processes of sedentarization as discussed briefly earlier.

This issue will not be pursued further, but it is clear that the pastoral nomads that existed in northeast Africa and the southern Levant during the 4th millennium witnessed an important

change that had never been seen before—the development of states and towns, including a more complex organization of society. The urban revolution began in the Middle East, and no other region in the world has such a long tradition of urban life. The tradition of sedentary groups of cultivators stretches even further back in time to the Natufian period (*ca.* 10000–8000 BC), where settled societies were scattered over selected areas profitable for a sedentary life. It is exactly this intermingling or mixing of different modes of subsistence and societies that has moulded and shaped the regions through the millennia. One significant part of this intermixing are the pastoral nomads, which for millennia have played the role of the mediator between these different modes of living and social organization, as part of a larger ecological and economic system that includes settled village societies and urban trading centres. The central issue here has been to focus on the development of different modes of specialized pastoralism and its relation to interregional exchange and relations. There are differences between the agricultural and pastoral production systems, though there are possibilities for mixed-economy farmers to become prosperous than both pastoral nomads and purely agriculturalists, even if they tend to occupy more marginal areas. This may in fact be the case during the late 5th and 4th millennia, both in Lower Nubia and in the southern Levant, where there seems to be evidence of a mixed economy, or regions where there are some collective economic institutions developing. In both regions there does seem to be evidence of a process of interconnection where growth is limited.

Concluding Remarks

In this chapter, the focus has been on the role of nomadic pastoralists, discussing briefly central aspects of present nomads in the region, as well as archaeological implications of identifying nomads. However, the most important issues are connected to pastoral nomadism in the 5th and 4th millennia BC, and the differences that seem to develop between large parts of northeast Africa (excluding the Nile Delta) and the southern Levant. Despite a number of similarities between sites in these regions, there are also differences that indicate a wide range of different strategies and political systems in formation during the 5th and 4th millennia BC in the southern Levant. The shift and division into different economic sectors, agriculture and pastoral nomadic, was therefore a consequence of several factors and not the cause of social change. Pastoral routes may have been vital in a process also including routes of exchange and contact. The next chapter will deal with the early metallurgical and metal finds in the regions discussed by analysing contexts, forms and function of the early copper artefacts, in order to understand the role of the metal itself and the possible role of pastoral nomads.

6 The Role of Copper in the Late 5th and 4th Millennia BC

This chapter examines the role of copper and metallurgy in the southern Levant, Egypt and Lower Nubia. There are striking elements, which may point to long-distance contacts and the vital role of pastoral nomadic groups in the adjacent arid zones. Firstly, the evidence of metallurgy is reviewed both with reference to mining, smelting and casting of the first metal in the region. Thereafter, the copper artefacts and their contexts are analysed, as this is the initial and introductory phase of metal in each of the regions considered. Lastly, some functional and metallurgical aspects of the copper artefacts are considered, as this may also indicate long-distance contacts.

Metallurgy—Mining, Smelting and Casting

Origin and Copper Ore-bearing Regions

In archaeology, metal and metallurgy have a special significance and play a central role in the interpretation and understanding of prehistory, often within an evolutionary framework from the early division of the three-period system. The origin of metallurgy is contested and is an issue that archaeologists have put much effort into over the last century. Several important developments of native copper-working took place on the Iranian Plateau, in Northern Mesopotamia and Anatolia in the late 8th and early 7th millennia BC (Heskel 1983; Muhly 1988; Hauptmann 1990, and others). There is evidence of early heat-treated metals at Çatal Hüyük, dating to the mid-7th millennium, but this technology is not found elsewhere in the Near East until the late 5th and early 4th millennia BC when alloying, casting and smelting appear. In Mesopotamia, evidence of metallurgy is extremely rare in the period between 5000 and 3500 BC (Moorey 1988a:29); not much is really known of the 3rd millennium BC either. The rich discoveries at the Royal Cemetery at Ur illustrate that metallurgy had reached a high technological level, but the evidence for industrial, large-scale or metallurgical specialists in terms of working implements is still lacking. A similar development distinguishes Egypt.

In the southern Levant, metallurgy is virtually absent before the late 5th millennium BC. The first evidence is dated to the Chalcolithic period. As several authors have argued (e.g. Hanbury-Tension 1986:151), metal artefacts appear relatively late in the southern Levant compared to the neighbouring regions as Anatolia, Mesopotamia and the Iranian Plateau. Hanbury-Tension (1986:151) argues that there is no evidence of metallurgy before the Late Chalcolithic and a minor development compared to Anatolia and Mesopotamia. Recently, Golden (1998:6) has suggested that the local use of copper probably precedes local production. His material is, according to his terminology, dated to the middle and late Chalcolithic, suggesting that the early Chalcolithic was a pre-metallic phase with the use of malachite. Golden (1998:116, and Table 4.1) points out that copper in the southern Levant does not appear until the middle phase of the Chalcolithic period from *ca.* 4200 BC. He goes on to state that the copper artefacts found at Ghassul, Masos, Mezer and Umm Qa'ala are among the earliest finds, based on ceramics, lack of production evidence and the chemical composition of the copper artefacts (Golden 1998:112). In contrast to Mesopotamia and Egypt, the southern Levant has several local resources, although these were probably not exploited for the processing of copper, until the Chalcolithic period. In Egypt and Lower Nubia, the evidence of mining and smelting activities is even scarcer during the 5th and 4th millennia BC.

Malachite is found in Pre-Pottery Neolithic B (PPNB) to Pottery Neolithic B (PNB) contexts at sites such as Jericho, but is not found in graves in the southern Levant, as acknowledged from Lower Nubia and Egypt. There does not appear to be a tradition for depositing malachite and palettes in graves, neither in the southern nor in the northern Levant. At Beihda VI, malachite was found together with ochre and haematite occurred in roughly shaped blocks (Mellaart 1975:65). In Egypt, malachite is known on palettes, on querns and rubbing stones and it is generally suggested as being used for cosmetic purposes, especially eye paint. Baumgartel (1960:1) suggests, 'It was used as a cosmetic by the Badarians, and also for glazing steatite beads to make them resemble turquoise, a stone they highly prized'. Malachite is found in the mountains to the east of Egypt and is easily reduced to metallic copper. In general, malachite is relatively common in graves from the Predynastic periods. Although the context of the Badarian grave 5112 is not clear due to possible plunder, the grave contained as small copper pin or awl, in addition to malachite 'paste' (Brunton and Caton-Thomson 1928:33). Malachite is found in graves from the Badarian phase and onwards in Upper Egypt, but is not known until much later in Lower Egypt, being absent from such sites as Merimde, Fayum and El Omari (Debono and Mortensen 1988:36).

Metal Artefacts and Metallurgy

As a general approach, it is necessary to differentiate between metal and metallurgy, especially in the context of early metal finds and metallurgical activities (i.e. mining, smelting and casting), because evidence of metal artefacts does not necessarily imply knowledge of metallurgy. In the early stages of metallurgy, one must assume that few had the actual skills involved with mining, smelting and casting. In addition, these artefacts 'travelled' with people over large areas. They were regarded as precious and highly prized—not necessarily as functional objects, but rather due to object rarity, as well as the symbolic properties of the objects themselves. Ethnographic records show that metallurgical knowledge was shared within the family, caste or clan. This secured production methods and its 'secrets' as unique specialisms (cf. Haaland 1985; Herbert 1993; Anfinset 1996). This would definitely lead to specific instances in the archaeological

record and to the discovery of metal artefacts in regions with neither the knowledge nor the possibility of smelting and casting metal objects. The procurement of native copper and the hammering itself are activities that need little planning or organization, with the exception of the actual labour. Smelting and casting, on the other hand, demand much more skill, organization and knowledge. Childe (1957) argued that the craft and skill were so important that metal work would be impossible without full-time specialists. The development of metallurgy was viewed as a major social transition, as well as a major technological transition, where miners and smiths were the first human groups to function independently of tribal bonds. This was a crucial prerequisite for the rise of civilization, which conformed to a view of archaeological stages described through technological stages (Childe 1944), as well as Childe's concept of an urban revolution (Childe 1950, 1951). The metal ages are often regarded as the progress of civilization, where copper would be the first stage in this development. In this process of development, trade in ore and metals supposedly played a significant factor in the progress toward civilization, developing centres based on metallurgy, where the smith played an important role in the development of interregional contact. In this case, urban civilization did not develop in the southern Levant until the Early Bronze Age II as argued in the preceding chapters, which is rather late in terms of the introduction of metallurgy to the region. During the EBA and the First Dynastic periods of Egypt, there was a growing specialization of the metallurgy itself, in terms of manufacture and standardization. This resulted in the organization of work by occupational specialists, development of social classes and inequality to a much larger degree than ever before. With regards to the late 5th and 4th millennia Forbes's (1964:4) description may be useful; 'Again one must not exaggerate the importance of metallurgy in these early societies. The progress of metallurgy was slow, for no doubt all metals were better than stone and it took a long schooling of generations of smiths and smelters to produce something like bronze which was definitely better than flint or polished stone. Still in the long run metallurgy had profound influence on early economy'.

It is significant to clearly define what metallurgy implies. Several authors use the word metallurgy synonymously with metal artefacts. This is however, misleading, as metal artefacts do not necessarily imply that the copper was smelted and the artefacts cast in the same region. Metallurgy here implies the actual smelting and casting process, which from a pyrotechnical point of view is the most fundamental change of substance: from nature to culture. It is central to separate these activities as they may have been performed in totally different settings and regions. The actual deposition and the use of metal artefacts may have a different distribution, and this is worthwhile exploring. Therefore, the contexts of these early metal and metallurgical finds will be analyzed in the succeeding sections.

Copper Mining in the Southern Levant

In the southern Levant, there are three areas possessing natural copper deposits. Possibly all three were exploited in the Chalcolithic period.

At Timna (Wadi el-Meneiyeh), the first evidence of mining and copper smelting has been dated to the 4th millennium BC (Site 39), with succeeding activities until the 2nd century AD (Rothenberg 1972; Rothenberg *et al.* 1978). According to Rothenberg (*et al.* 1978:1), there is no evidence of shaft or gallery copper mining at Timna during the Chalcolithic period and the activities are dated tentatively on the basis of finds of pottery, flint and stone tools. It is likely that mining activity used only surface ore by trenching and pitting. Site 39A revealed

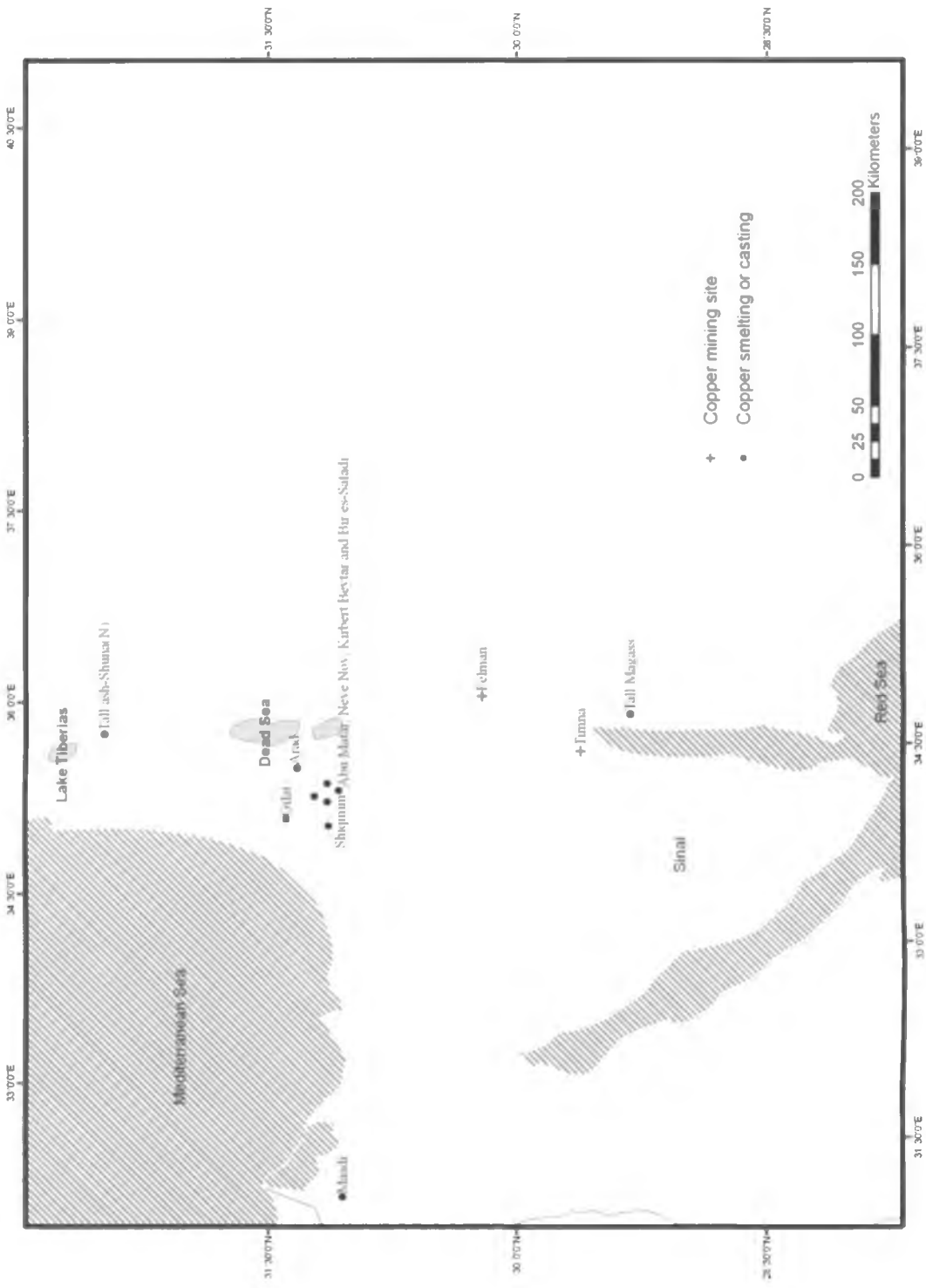


Figure 6.1 Map of the mining sites, smelting and casting sites from Chalcolithic and EB I.

fireplaces and a pit that has been interpreted as a dwelling and working camp, possibly for smelting preparation, while the actual smelting site (Site 39B) was found a few metres away (Rothenberg *et al.* 1978:7). Recently, Rothenberg and Merkel (1995) have also argued that the smelting of copper at Timna can be dated as far back as the Late Neolithic. Both Muhly (1984, 1988) and Weisgerber and Hauptmann (1988:53) have questioned the early dates and material from Timna, arguing that the evidence is rather scanty and implying that more documentation is needed. Muhly (1976:92–3) argues that the evidence at Timna is not dated earlier than EB II and must be seen in relation to the developments at Tell Arad in the early Bronze Age. In any case, there is a methodological problem with the actual smelting site which is not dated to the Chalcolithic period. A radiometric dating gave 5 AD ± 309 (BM 1116) according to Weinstein (1984). Although there are indications of a Chalcolithic presence in terms of lithic artefacts and pottery at Site 39A, this does not necessarily imply actual mining or smelting of copper at the site.

The Feinan area has had continuous copper production for several millennia up until the 13th century AD (Hauptmann *et al.* 1989:8–10). The area first came into use during the PPN as flint tools were found together with copper ore at a site in the Wadi Fidan (Hauptman 1990:56). It is probable that this green stone was used for cosmetic purposes, as it has been found on several sites within the region. Sites from the PN have evidence of copper ore, though no metallurgical treatment has been documented. Hauptmann (1990:56–7) reports that smelting at Feinan during the Chalcolithic period must have been small scale, as only a few pieces of slag and copper prills were found. However, the Chalcolithic settlement of the Tell Wadi Feinan region (Wadi Fidan 4) has revealed evidence of metallurgy and mining tools, interpreted as a community involved in small-scale domestic production of metal (Adams and Genz 1995). The interesting feature here is again that the ore was transported and processed inside the domestic sphere, though the character of the architecture and the finds do not rule out the possibility of a nomadic or seasonal occupation—an issue already discussed. However, various mining tools were found in waste dumps, indicating extensive malachite and tile ore, but mining activity seems to have been small-scale compared to the later Bronze Age activity (Hauptmann 1990:57). Archaeometallurgical studies of slag from Feinan have shown that the typology of slag changes little from the Chalcolithic to the end of the Bronze Age (Hauptmann *et al.* 1989:11). The analysis suggests that ore from Feinan was used at sites in the Beersheba region and even at Maadi in Lower Egypt (Hauptmann 1989:131). Feinan has evidence of being worked during the Chalcolithic period, although the majority of the material seems to be of EB date (cf. Golden *et al.* 2001).

The Sinai-peninsula is also rich in copper and mineral resources, although minerals and ores were not exploited until the EB (Beit-Arieh 1983, 1985; Ilan and Sebbane 1989:142, 148) and must be seen in the context of the expansion of the Old Kingdom in Egypt and the establishment of Tell Arad. This is further supported by Beit-Arieh (2003:196–208) who confines copper production in Sinai to EB II. A source of arsenic copper has been identified (Ilani and Rosenfeld 1994), but it is uncertain whether this was exploited in the Chalcolithic period.

Presently, the Feinan region appears to be the area where copper ore was retrieved before being brought to sites in the Beersheba region in the Chalcolithic period. Other possibilities cannot be ruled out, especially with regard to small ore sites in the Sinai and Negev peninsula.

In any case, archaeological approaches to Chalcolithic copper mining in the Southern Levant have indeed focused on the technological aspects of measuring and tracing site origin, as well as the physical properties of the mining. The social context of this activity, including a focus on social organization, human behaviour, ideology and circumstances involved with mining, has been more or less neglected. As Knapp (1998:1) points out, such activities are linked to broader social, communication, transport and economic networks, as well as geographic mobility. Therefore, the sole focus on technology is not the determining force itself.

Copper Smelting and Casting in the Southern Levant

Smelting and casting is often neatly connected to mining activities. The smelting especially is in most cases known to be performed close to the mining site for logistical reasons. Casting, on the other hand, is not necessarily geographically connected to mining and smelting areas and may be performed in a totally different setting and context depending on social and economic structures (cf. Anfinset 1996).

In the southern Levant, several have noted (e.g. Hanbury-Tenison 1986; Ilan and Sebbane 1989; Levy and Shalev 1989; Shalev 1994) that the metallurgy is confined to the Beersheba region during the Chalcolithic period. Levy and Shalev (1989:fig. 1) have identified ten sites with what they call 'industrial remains', although Shalev (1994:fig. 1) recently only illustrated seven Chalcolithic metal production sites. According to Levy and Shalev (1989:360, table 2), 'industrial' copper smelting remains are confined to the southernmost part of the Levant on the fringes of the desert (see Fig. 6.1). In reference to the metallurgical remains, with the exception of Shiqmim and Tell Arad, most other sites are only partially published (such as Neve Noy, Horvat Beter, Abu Matar and Gilat), or not published at all (such as Bir es Safadi, Masos, Oudah and Besor). More recently, Golden (1998:146–7) has stated that there is no evidence of copper production at Gilat, Tel Masos and Abu Hof. In Nahal Besor, site M, site D and site O are all without any indications of copper and predate the Beersheba sites, while Besor site H and En Besor are dated to the EB I and at both these sites copper is present (Golden 1998:148).

Excavated in the early 1980s, Shiqmim (Levy 1987; Golden *et al.* 2001; Levy *et al.* 2006) is probably the best and most extensively excavated Chalcolithic site in the Beersheba region. Slag and ore were found scattered over the entire excavation area, mostly in association with slag and charred wood (Shalev and Northover 1987:362). Only 659g of slag and 634g of ore have been recovered, which is not substantial in a metallurgical sense (cf. Golden *et al.* 2001:952). According to Shalev and Northover (1987:362), the ore fragments consisted of rich copper oxide—similar to ore from sites such as Abu Matar and Neve Noy. Archaeometallurgical analysis indicates Wadi Fenan, rather than Timna as the source area. Small pieces of slag were found all over the site and some slag was found near a suggested copper-working installation (Shalev and Northover 1987:363–4), although the character of this installation seems rather diffuse. Analysis of the slag indicated two different types. One was connected with smelting and re-smelting, while the other was connected with smelting or a refining process (Shalev and Northover 1987:364). This should indicate that all parts of the technological process, from smelting to casting, must have been practised to some extent at the site. An estimate, based on the slag recovered and the total size of the site, indicates a total of 20kg of slag on the entire site during the last occupation phases (Levy and Shalev

1989:365). From Shiqmim, there are two crucible fragments identified from different areas of the village. One was found together with drops of slag and an axe. The second was attached to a thick layer of vitrified material and a piece of slag (Shalev and Northover 1987:363). According to Shalev and Northover (1987:363), both the crucibles represent the second phase of the local metal industry. A recent excavation at Shiqmim yielded no new evidence of metallurgy at the site, but a nearby site called Mezad Aluf is interpreted as a production hamlet. At this site, a few pieces of copper ores and some slag were recovered (Golden *et al.* 2001:959).

The site of Abu Matar in Beersheba was excavated in the early 1950s, yielding the best evidence of a Chalcolithic smelting technology. Copper ore was found on all levels at the site and several kilograms were found in house 218, Level II, in the proximity of two stone slabs of flint, probably used as an anvil for crushing ore. According to the excavator, the crushed ore was reduced in ordinary fire pits, while the smelting was performed in specially constructed ovens. In one area (244), there were numerous fragments of small fireplaces, ovens and crucibles (Perrot 1955:79). The crucible remnants have been estimated to complete roughly 14 vessels (Golden *et al.* 2001:956), while a total of 1300g of slag and 2242g of ore were recovered (Golden 1998:421–4). At Abu Matar four different loci had the remains of smelting, all from subterranean structures or oval depressions. The oval depression (locus 244) had the most substantial material, including half crucibles and 70% of the actual furnace walls. It has been interpreted as a workshop, while the other remains are found in domestic contexts (Golden 1998:302). Golden interprets this as an increase and concentration in one area, as the subterranean context is regarded as being earlier than the workshop. According to analysis, sulphur was present in the slag from Abu Matar (Shalev and Northover 1987:364). Examination of smelting remains from Abu Matar and Bir Safadi, both contemporary to Feinan, showed similar smelting remains, showing that the ore was probably brought to the site to be smelted, in a manner similar to that employed at Feinan (Hauptmann in Craddock 1995:128–9). Copper axes from Abu Matar were also shown to be of very pure metal, with only small traces of iron. This corresponds to what would be expected from the relatively pure ores at Feinan, which were reduced under poor conditions. At a renewed excavation in 1990–1 (Gilead *et al.* 1991, 1992), two areas at the site provided evidence of copper. In Area A, the remains of an installation for copper processing were discovered. The excavators interpreted this to be an oven with a 50 cm diameter. This is probably connected to copper smelting by its baked walls, which are indicative of high temperatures while in use (Gilead *et al.* 1991:175). In addition, slag, fragments of crucibles, copper ore and a ceramic fragment resembling a tuyere were found in the vicinity of the oven, indicating that the installation was also used for processing or casting after the actual smelting (Gilead *et al.* 1991:175). Further, an artefact concentration was also found, with split cobbles used as anvils and smaller pebbles used as hammer stones. In another area, Area M, more than 0.5kg of copper ore, as well as copper slag and fragments of crucibles were found in a pit (Gilead *et al.* 1991:176–7). The excavators interpreted this area to be a habitation quarter with metallurgical remains (Gilead *et al.* 1992:13).

At Tell Arad, only one crude crucible was found in the Chalcolithic stratum of the site. According to the excavator, it was similar to those found in large numbers at Abu Matar (Amiran 1978:9). With greenish blobs of copper-bearing minerals adhering to the inner surface, there can be no doubt that it is a crucible. However, this is the only evidence that

can be connected to copper smelting at Arad during the Chalcolithic period, although similar crucibles were found in the subsequent EB strata above.

Neve Noy is situated a few hundred metres away from Bir Safadi (see below). This site is also dated to the Chalcolithic period, with evidence of copper smelting (Eldar and Baumgarten 1985; see also Baumgarten 1983; Cohen 1985). Although the site is sparsely published, it gives a picture of copper production corresponding to Perrot's excavation and the later excavation of Gilead *et al.* at Abu Matar. In a sunken rectangular courtyard, with adjacent tunnels and galleries, various artefacts associated with copper smelting were found, such as a small crater or crucible, copper ore, slag, a possible tuyere, five copper nodules, a work table, mortar and anvil (Eldar and Baumgarten 1985:136–7). The tuyere is doubtful and has not been documented. The excavators observed two possible smelting furnaces. One was located at the opening of one of the blocked galleries in the sunken courtyard (Eldar and Baumgarten 1985:137–8). Further, five copper artefacts were found bound together in the courtyard, consisting of a possible bracelet, two axes and two standards. Parallels and similarities to the hoard at Nahal Mishmar are evident (Bar-Adon 1980). Pottery finds at Neve Noy were relatively few compared to other contemporary sites, but a substantial number of churn fragments were recovered (Cohen 1985:74).

At Horvat Beter (Khirbet Beytar) there is evidence of copper smelting (Dothan 1959a:32–40) with both copper ore and slag found. Analysis of the copper slag showed the copper to be a technological product (Dothan 1959a:32). In this case, the quantity of the copper and slag are not estimated, but it appears to be small although the finds are described as, 'a large quantity of copper ore and slag' (Dothan 1959a:32). An analysis of the ore suggests similarities to Abu Matar. A salvage excavation in 1982 (Rosen and Eldar 1993) did not yield any new evidence of metal or metallurgy.

Gilat in Nahal Patish in the Beersheba region is also interpreted to be a site containing 'industrial remains of copper production', according to Levy and Shalev (1989:fig. 1 and table 2). However, nothing has yet been published on the metallurgical remains, the descriptions of finds, the circumstances, or the scale. The site has been interpreted to be a cultic site or sanctuary (Alon 1976, 1977; Alon and Levy 1989) with similarities to Ein Gedi.

According to Levy and Shalev (1989:fig. 1 and table 2), the site of Bir Safadi, which was excavated by Perrot in the 1950s, also had metallurgical remains. This is supported by Golden (1998:68), who mentions evidence of metallurgical craft, although this is not as extensive as that found at Abu Matar. The nature of these finds remains unclear, however, both with reference to scale and to context.

In general, no moulds have been found as stray finds or in the context of Chalcolithic copper smelting. Slag, ore and fireplaces or pits and a few crucibles have been found. It is suggested that the ore was brought to the sites, but interestingly the closest ore source is 150–200 km away (Feinan, Sinai and Timna). Why was the ore refined at the sites in the Beersheba region and not closer to the ore sites themselves? Under what circumstances may this have occurred? The scarcity of artefacts resulting from copper production at the sites in the Beersheba region gives rise to questions as to whether this was an 'industry'. The scale and amount of slag and ore does not seem to represent intensive activity, but rather one or a few cases of experimental smelting.

Shalev and Northover (1987:364) point out that the material from Shiqmim reflects a different type of ore and smelting technology than that required for the smelting of prestige

items. These special items must have been imported to the site, as they required a specialized casting technique and an understanding of alloying, often associated with a specialized production centre. It is argued that the eastern side of the Arava valley is a source area for the metal industry, as well as for the production of materials used in 'elite' industries (Shalev and Northover 1987:366). However, neither the scale nor the actual production suggests a utilitarian industrial complex or an 'elite' site, although the small number of finished copper artefacts found on the site was rather 'utilitarian' in nature. Golden (1998:327) suggests a regular or daily activity of casting the pure and utilitarian copper objects at sites like Abu Matar and Shiqmim, although the scale of both copper artefacts and metallurgical evidence is low. Further, the spatial distribution of the evidence connected to copper smelting is spread over the entire excavated area (see Shalev and Northover 1987:684, ig. 14.1). If this is not due to site formation processes, it must indicate that several households were involved in this formative and experimental metallurgy. Although less than 5% of the site has been excavated (Levy and Shalev 1989:365), the material connected to mining, smelting and casting of copper at Shiqmim is scarce.

Analysis of possible furnaces and crucible remains has been lacking, as focus has been placed on the finished metal objects. Golden (1998) has analysed a number of these fragments to better understand the technological processes. In his recent study (Golden 1998:255–60), he analysed a small copper fragment from Bir es-Safadi, which he interprets as a possible ingot on the basis of its rounded ends and that it was probably re-heated subsequent to casting as annealing twins appeared when magnified. However, the artefact is relatively small: 2 × 3 cm with a weight of 36g. The composition (Golden 1998:260, table 9.1) shows relatively high contents of antimony, arsenic and lead, quite similar to other sites, such as Nahal Mishmar. Golden (1998:259–60) therefore suggests that this artefact with a complex composition was brought into the Beersheba region to be used by the local smiths, as it is different from the copper ore found in the Chalcolithic settlements of the Beersheba region and could not have produced here. On the basis of the analysis of a copper lump from Nahal Qanah and a rectangular object from Bir es-Safadi, Golden (1998:78–80) argues there is evidence of complex casting being produced locally, while the raw material itself has been imported from elsewhere. Golden (1998) has also analysed copper ore, slag, crucibles and furnace remains from Abu Matar, Shiqmim, Bir es-Safadi and artefacts from Gilat and Nahal Tillah 79. As already mentioned, furnace remains from the Chalcolithic are scarcely known, but have probably been found at Abu Matar and Bir es-Safadi. They are all found as simple pits with partial clay-lining remaining. Golden (1998:fig 6.9) used no scale and it is therefore difficult to evaluate the size. However, although the material of furnaces is scarce and dubious, there cannot be any doubt that there was some kind of local production of copper, while it is questionable if this also included complex castings such as *cire perdue*. Golden's (1998:218) analysis of the ore from Beersheba suggests that it was brought from Feinan and they paid particular interest in the 'self-fluxing' ore. Ore from Shiqmim, Abu Matar, Bir es-Safadi and, to a lesser extent, Nahal Tillah 79, forms a consistent group of ore. Golden (1998:218) therefore suggests that itinerant tradesmen or commonly commissioned expeditions of those who were familiar with the ore brought it to the sites in the Beersheba region. He also suggests that the smelting was a seasonal activity, confined to the dry season (Golden 1998:313).

One must also keep in mind that the crucible found at Arad is the only evidence of smelting or casting, as there is no further evidence of slag, copper ore, workshops, etc. At Horvat Beter

there is nothing that suggests that copper smelting or casting was a significant part of the settlement or which could indicate either scale or craft specialization. Moreover, the evidence of tuyeres is also scarce.

In total, the evidence thus far indicates that copper was only produced on a very limited scale at a few sites in the Beersheba region of the southern Levant during the Chalcolithic period.

'Copper Industry' in EB I

Moving into the latter half of the 4th millennium and EB I, the picture is even less clear than in the preceding period. Not much is known about the organizational basis of the copper mining and smelting at Feinan (see Fig. 6.1). There is no evidence of a major centre during the later EB periods (II and III) when the production increased. In fact Phillip (2001:213) suggests that mining and smelting were operated in a way that did not leave much archaeological evidence. Furthermore Feinan's position in an arid region may have constrained the development in the region.

East of the Rift Valley

In southern Jordan metalworking is known from Tall Magass near Aqaba (Khalil 1992; Khalil and Riederer 1998) at a site which has settlement from both Chalcolithic and Early Bronze Age, although the published material is not clear. However, there is evidence of copper ore, slag (300 g) and metallic copper, including pellets or drops (320g), crucibles (two sherds), lumps of copper (490 g) and awls (no amount stated). Copper seems to be only part of the work going on at the site, in addition to flint, bone, shell and pottery. The material indicates an EB I date, rather than Chalcolithic, though what is interesting are the copper awls, the wide-ranging contacts and an additional site, Hujeirat al Ghuzlan, which also has metallurgical traces contemporary with Magass. Phillip (2001:213) also argues that metalworking debris, including round-based crucibles, small rectangular moulds and metal prills, was found in an EB I midden or rich rubbish deposit at Tall ash-Shuna (N) in the Jordan Valley, probably indicating melting and casting, rather than smelting. However, there is no evidence of ovens, furnaces or tuyeres. The copper ore from Shuna contained both arsenic and nickel (2%), which is not known in the ores from Feinan. The mould material suggests thin ingots. According to Rehren (Rehren *et al.* 1997:625–6), this context is dated between 3400 and 2900 BC and the pottery suggests late EB I. As they further note, the metallurgical remains were found together with animal bones, carbonized material and pottery, indicating that this activity was not treated separately from other domestic activities. This may in fact point to the tendency of a small but integrated part of the household activity. One of the most significant finds in terms of copper and metallurgical activities is the evidence of both crucibles and moulds dated to EB I. A number of small fragments of crucibles, probably from an open vessel of rounded shape with curving sides, were found and several of the fragments had their surfaces covered by green corrosion and prills. These consisted of pure copper with elements of nickel, arsenic and iron trapped within the crucibles (Rehren *et al.* 1997:626–8, table 1). This is not dissimilar from what is known of the composition of the 'prestige' items from the Chalcolithic period. About 10 fragments of small rectilinear vessels with flat bases and straight sides have been interpreted as mould fragments. The fact that several fragments had copper adhering to the interior surfaces suggests that these were undoubtedly moulds, possibly for casting small rectangular metal blanks (Rehren *et al.* 1997:626). Analysis

suggests that this was produced from a different fabric than the contemporary Shuna pottery repertoire (Rehren *et al.* 1997:627).

The question is *why* produce metal blanks at Shuna? Rehren *et al.* (1997:636) suggest that the moulds were specifically intended for the production of rectangular ingots. They discuss the possibility of a kind of pre-form, for example for an axe, but regard this as less likely and suggest that the ingots are part of some kind of redistribution and a basis for further treatment. They draw parallels to later EBA finds, such as Kafar Monash and other sites, where large amounts of copper sheets have been found. There are two issues here that are worth consideration. First of all, the moulds are indeed fragmentary and far from complete and whether they are ingots or not should remain in question for the time being. In addition, it is well known that cast copper objects, whether they are cast by complex methods such as *cire perdue* or the more simple open mould, need some kind of work and treatment after the initial casting. A second consideration is the parallel to the later EBA (II-III) copper sheets. These in fact represent a totally different context, both with regard to the urban societies and the clear evidence of much more organized and large-scale metallurgy, as illustrated by Golden (*et al.* 2001, and others). Under any circumstances, it is clear that the evidence must represent early specialization in smithing, and may, as Rehren (*et al.* 1997:636, with references) argues, be connected to the important geographical position of Shuna at the junction of several important routes and playing a prominent role in the copper distribution during EB I.

Phillip (2001:214) has argued that, 'Early Bronze Age copper procurement appears as a more complex and varied process than might have been expected in the light of the ready availability of ores in southern Jordan'. An interesting feature at Shuna is in fact that there is evidence of melting and casting and no evidence of smelting, although this cannot be ruled out (Rehren *et al.* 1997:629, see also page 626 for a discussion on the possibility of slagless smelting). This is indeed interesting as it divulges information about the organization of the work connected to copper metallurgy. There clearly seem to be differences in the Chalcolithic and the EB I activities, which may in fact further support a different social organization of the work in the two periods considered here. Although the evidence is far from conclusive, there seem to be elements and patterns of differences which are worth noting.

Rehren (*et al.* 1997:635 with reference to Adams and Genz 1995) notes that there is evidence of small-scale on-site copper smelting at Wadi Fidan 4 during the latter half of the 4th millennium BC (EB I). This may further confirm the hypothesis of a change in the social organization and procurement of copper from the Chalcolithic to EB I. Again, as in the Chalcolithic, there is a discrepancy between the evidence of mining, smelting and casting activities, which gives information about the social organization of the early and formative activities of metallurgy. Shuna is about 150 km north of the nearest copper ore sites in Wadi Arabah, although in this case the analysis of the prills indicates that they do not stem from this region, but rather are a result of recycling and metal trading. Ilan and Sebbane (1989:144) have suggested that all the metallurgical activities took place in the proximity of the mining areas during EB I, though the evidence from Shuna, as Rehren (*et al.* 1997:636) has pointed out, makes the picture more complicated.

All the copper prills found at Shuna are relatively small: the biggest is 1.8 cm in diameter, while those trapped in the moulds and crucibles were almost invisible to the naked eye (Rehren *et al.* 1997:629). Rehren (*et al.* 1997:634) indicates that the analysis of the composition of

the metal prills containing nickel and arsenic is relatively common in western Asia and is regarded as an unintentional result due to the use of mixed ores. In addition to nickel and arsenic, there are elements of iron, lead and tin, demonstrating that this copper is relatively impure compared to other sources in the southern Levant, indicating the use of more complex sulphide-containing ore (Rehren *et al.* 1997:634).

West of the Rift Valley

The mining of copper in the EB I to the west of the Jordan River is, to a large extent, ambiguous. According to Ilan and Sebbane (1989:148, with reference to Rothenberg 1978:1–2, and Hauptmann *et al.* 1985:172) both Rothenberg and Hauptmann *et al.* have attributed the first shaft mines at Timna and Feinan to the EB I on the basis of pottery found in the shafts. Although this has not been sufficiently published, any mining activities in the EB I remain unclear on the basis of the nature and the scale of the evidence. If the scarce evidence is interpreted as positive, the amount and scale still demonstrates an extremely low level of activities. Further, a few metallurgical analyses have been made on EB I artefacts from Megiddo (Loud 1948:pl.238:1), Kafar Monash (Key 1963:289–90, see discussion elsewhere), Azor (Ben-Tor 1975:23). Due to this obvious lack of metallurgical evidence, Ilan and Sebbane (1989:143–4) have suggested that the smelting and the production of utensils may have taken place near the mines. They suggest that only the utensils were produced locally and sent northwards as finished products, although there is no indicative material of this at all. The mines they refer to here are in the Arava Valley (Arava—Site 202; Arava—Site 190; Arava—Site 189; Arava—Site 188; Arava—Site 39; Arava—Site 29; Arava—Site 42; Arava—Site 182; Be'er Ora). The material remains mainly unpublished, and for the time being, it is rather doubtful if there was any mining of copper there in EB I at all. In Sinai, the sites (Site 1035; Site 1039; Site 1038; Site 1041; Site 688) have been dated to EB II (Beit-Arieh 1983). Ilan and Sebbane (1989:148, n.9) cast doubt on this dating, as there is little datable material, with the exception of one holemouth jar fragment from Site 1039. Indeed, the mining evidence dated to the EB I is, as they admit, vague (Ilan and Sebbane 1989:148).

There are a few crucibles found in EB I context at a few sites, such as Arad (Amiran 1978:pl. 67:12), Tel Erani (unpublished, but Ilan and Sebbane 1989:143 mentions this site), Small Tel Malhata (unpublished, but Ilan and Sebbane 1989:143 mentions this site) and Lachish (Tufnell 1958:144–5, pl. 57:71). Hanbury-Tenison (1986:154) mentions a possible handmade crucible (round bodied, squat jug) at Gibeon found in Cave 3, and interpreted by the excavator as a crucible (Pritchard 1963:10, fig.6:10). Hanbury-Tenison (1986:155) mentions a possible crucible found on a floor in Area C, Stratum 1 (Dothan 1959a:20, fig.9) at Horvat Beter.

In addition, slag is supposedly found in an EB I context at En Besor, Site H (MacDonald 1932:12) and Hanbury-Tenison (1986:155) mentions it was found together with quantities of haematite, copper prills and finished products, such as hooks, points, needles and a dagger. Golden (1998:4) mentions four 'shaft' awls, which had been hammered and annealed, in addition to lumps of copper and slag.

Recently Shalev (2004) has published evidence of EB I metallurgy along the Mediterranean coast (Coastal Plain), though in general the nature and the scale of the metallurgy of EB I is still a matter of debate.

In sum, the picture of the EB I is clearly different from the preceding Chalcolithic. It cannot be described as substantial, but rather, flimsy and unclear.

The Southern Levant and a Lithic Perspective on Metallurgy

Rosen has, on a number of occasions, argued that studies of the stone tool industries have given a clear picture of the disappearance of numerous flint tools presumed to be functional (Rosen 1984, 1997 etc.). The reasons for this have been interpreted as increased trade with metal, the scarcity and high cost of metal, the good availability of flint in the region, relative differences in the manufacture of flint and metal tools, and the relative difference in efficiency between the two raw materials (Rosen 1984:504). Rosen further suggests that with the development of trade connections with metal areas in Sinai and the Beersheba region, only two functional types of tools—the celts/axes and awls/drills—disappear in the late Chalcolithic and EBA, while other functional flint tools still continue to be used, due to the limited availability of copper and the efficiency of flint tools. Interestingly, Rosen (1984:504) also points out that the drills and awls are present in an EB I context, especially in the Negev, but seem to disappear in EB II with the development of the first urban settlements. However, it is also significant that Rosen (1988, 1997) has pointed out that lithics were already declining as metal was introduced.

Smelting and Casting in Lower Egypt—Maadi

Maadi from the Predynastic period in Lower Egypt is thus far the only site to have any evidence of copper smelting and casting (see Fig. 7.1). Although the evidence is circumstantial with regards to smelting and casting, there is at least evidence of copper ore present at the site. Rizkana and Seeher (1989:17) suggest that two of the ingots had been cast in a shallow open mould, while the third one has a different shape and was cast in a trough-shaped, longish mould with an open top. The two similar ingots have almost the same weight: 824g and 835g respectively. Ingots are not known from the southern Levant (except the mould fragment found at Shuna mentioned above), Nubia or other sites in Egypt. What is special at Maadi is that a 'large hoard of copper ore' was also found in one of the sebakh holes (Menghin and Amer 1936:48; Rizkana and Seeher 1989:17). It consisted of lumps of copper ore in various sizes weighing a total of 15.7 kg. Pernicka and Hauptmann (1989:137–40) argue that this ore was not suitable for smelting due to its low copper content, but was probably used as colour pigment. During the excavation, there was also found about 50 smaller pieces of copper ore, about 50 smaller fragments of worked copper and a few unidentifiable fragments. It is unclear whether Maadi represents a local copper industry, or if the evidence from Maadi has been exaggerated and misinterpreted. Dittmann (1936:158) mentions a metal workshop at Maadi, but Rizkana and Seeher (1989:17) maintain that there is no evidence of slag, crucibles, moulds or forge. Therefore, again, the evidence of copper smelting and casting in Predynastic Egypt is non-existent. Further, Rizkana and Seeher (1989:17) argue; 'From an economical point of view it is downright nonsense to transport ore for the extraction of copper over a longer distance.' Hayes (1965:128) suggests that Maadi has been a centre of copper production, as copper ore was imported and worked in bulk and that they had the knowledge of both smelting and casting a variety of metal implements. Rizkana and Seeher (1984:239) argue that this is exaggerated and the evidence of copper smelting is still vague. More recently, Hauptmann (1989) has identified this ore as coming from Feinan in Jordan and not from the Sinai Peninsula. This fits well with the discoveries in Sinai which seem to be slightly later. The exploitation of copper here seems to be connected with the consolidation of the First Dynasties in Egypt, as well as with the formation of the first cities in the southern Levant,

such as Arad during EB II. The evidence of prehistoric exploitation in Sinai is, however, rather small-scale compared with the huge state-sponsored expeditions which began in the Early Dynastic period (Shaw 1998:243).

The Lack of Evidence of Mining, Smelting and Casting in Lower Nubia, Upper and Middle Egypt

During the late 5th and 4th millennia BC, the evidence of copper mining and smelting in Egypt or in Lower Nubia is scarce. This appears strange, as these regions, in addition to the Eastern Desert, are known to be copper-bearing. The number of copper artefacts increases dramatically during the 4th millennium BC in both Egypt and Nubia from virtually nothing to relatively high numbers, as will be illustrated in the next sections. Crowfoot Payne (1993:146) has suggested the copper of Predynastic Egypt comes from either the Sinai or the Eastern Desert and is either native or smelted. Small pieces and fragments of copper ore (malachite) from graves and sites are known, but there is hardly any proven evidence of smelting or casting. From Hierakonpolis, described as both the 'Prehistoric Cemetery' and 'Predynastic Town' by Brunton, one black ware sherd (UC 27528) had a lump of copper ore adhering to the exterior (B. Adams 1974:80). Adams (1995:172) argues that the fragmentary knowledge of metalwork at Hierakonpolis during the Early Dynastic period may be due to the fact that the workshops have yet to be found, possibly because they are situated outside the excavated area or the conditions for preservation have not been good. On the other hand, it may also be argued that much of archaeology in the region has focused on other issues than small fragments of slag and copper ore. However, the evidence for a production area is rather flimsy and unclear.

Midant-Reynes (2000a:194) suggests that the copper industry began to flourish during Naqada II. Although the number of copper artefacts increased dramatically, there is no evidence of either an industry or any copper smelting during this period. Here, Hierakonpolis is suggested as a key centre in the southern frontier in terms of copper, gold and the ivory trade. The two latter may be correct, but the copper connection still remains a mystery. It might be linked to copper resources in the deserts, or as a central place for trade links through the Eastern Desert, connected to the southern Levant. At Naqada in Tomb 522 (Baumgartel 1970:XXII), two mud crucibles were found together with 21 pots. At Khor Bahan in Cemetery 17, Grave 56 (Predynastic), a rich grave contained what the excavator identified as a crucible of thick coarse reddish ware (Reisner 1910:118). In addition, three possible crucibles made of slightly baked mud and containing different coloured resin were found in Grave 58 (Reisner 1910:120–1). There is no further information or contextual circumstances which could clarify whether these were used for copper smelting and casting.

Shaw (1998:243, with reference to Rothenberg 1995) argues that there is evidence of slag from Predynastic copper mines at Bir Nasib in central southern Sinai, in addition to turquoise mining, during the Chalcolithic period at Serabit el-Khadim (Beit Arieh 1980). However, this evidence is highly circumstantial and the dating of these activities, the copper mining in particular, is disputed. Under any circumstances, the activities in the Sinai Peninsula and in the Eastern Desert must have been small scale compared to the large expeditions of the Early Dynastic periods (after 3000 BC). Lucas (1962:209) argues that it is during the Old Kingdom that the sites of Magharah and Serabit el-Khadim in Sinai are used, and the earliest dated import of copper to Egypt is as late as the 18th and 19th Dynasties. As Shaw (1998:243) points out, in the Old Kingdom there is both archaeological and textual evidence of these activities, not only

connected to copper but also to other metals and minerals. The earliest evidence of mining is from Wadi Dara, southeast of Abydos, and dated to the Old Kingdom, as well as the copper smelting area at Buhen in Lower Nubia, also dated to the same period (Shaw 1998:243–4). It is possible that Lower Nubia was exploited earlier, but the copper processing area has been dated by seal impressions to the Fourth to Sixth Dynasties, with some possible activities during the Second Dynasty (Shaw 1998:244). Copper ore is also known in the Eastern Desert, such as Wadi Araba, Gebel Atawi, Gebel Dara, Dungash (more known for gold), Hamish, Abu Seyal, Kubban and Umm Semuki, but these are all dated to the historical periods (Lucas 1962:205–206). However, the research focus has not been on identifying possible sources of Predynastic activities, and one should therefore not rule out the possibility of future finds that may change this picture. Wadi Dara is close to the mouth of Wadi Hammamat, which has been suggested by several as one possible route to the Red Sea, during the Predynastic periods and a possible contact by sea with the Arabian Peninsula and Mesopotamia. Yet more fieldwork is needed to evaluate this. There is no evidence of any earlier mining or copper smelting in Egypt or Lower Nubia, although there is good evidence of copper artefacts. When it is recovered, the evidence is in the form of state expeditions and exploitations on a totally different scale of management, economy and organization than witnessed in the prehistoric periods. From the Old Kingdom onwards, the picture is completely different from the Predynastic periods, and there is good evidence of mining copper at Wadi Dara and smelting copper at Buhen (Shaw 1998:243–4). Shaw (1998:244) does not rule out the possibility of activity at Buhen as early as the First or Second Dynasty, although this is only based on radiocarbon dates. During the Old Kingdom, Egypt obtained much of its copper and other metals from within their borders (Shaw 1998:244), although it began to exploit Lower Nubia for metals such as copper and gold (Emery 1965; Piotrovsky 1967). From the early Dynastic period slag and a possible crucible is found in one of the royal tombs at Naqada (Quibell 1905:177), though we will come back to this issue in Chapter 8.

Why did the people of Predynastic Egypt and Nubia not take advantage of these resources at an earlier stage, and why did they not develop mining and smelting of copper although they clearly used copper artefacts? As will be seen later, the metal artefacts are increasingly incorporated throughout the 4th millennium BC. There are several possible avenues for this. One is the actual technological know-how, which may not have been present and could be supported by the lack of any metallurgical evidence during these periods. Another is a cultural 'barrier', where copper at the early stages was not regarded as important, or having social value. However, once copper artefacts are introduced, they seem to gain a relatively high social value, as will be illustrated further in this chapter and the next.

The issue of the ecological effects connected to mining and smelting of copper has never been considered. Especially when it is acknowledged that these sites are located on the edge of the desert, one would expect just a small increase in the demand for fuel to have an major impact on the natural vegetation, regardless of whether wood or charcoal were being used. This is a factor that may also be raised for mining activities at Feinan, Timna and later at Buhen in Egypt. An important issue concerning the large-scale mining activities during Dynastic times at places such as Timna, Feinan, etc. is where the wood or charcoal came from. This is an issue that requires consideration but will not be pursued further here.

The understanding of the mining and the smelting of copper in Egypt and Lower Nubia (excluding Maadi) is not clear, and the question of where they attained the copper arises. As

will be argued later, Maadi seems to be part of the Near Eastern complex, both with reference to metallurgy, depositional context, and adaptation in general.

Copper Artefacts and Contexts

In this section, the copper artefacts of the late 5th and 4th millennia will be placed one step further into a social context by analysing the nature or type of artefact and their depositional context. However, this does not exclude the possibility that both the metal artefacts and the metallurgical activities may be part of the same context, as is the case in the southern Levant and more specifically the Beersheba region. As already pointed out earlier, this is quite different from the Predynastic period of Egypt and the Lower Nubia (except for Maadi in the Lower Delta). Here, the focus is on the depositional context of the copper artefacts, i.e. both on a macro and micro level of investigation. A micro level refers to the site context or the general impression of the finds (i.e. cave, hoard, village, burial etc.), in the end, this may be connected to a larger macro cultural context where meaning and understanding can be deducted. The data presented here is purely based on earlier research and publications, and in that sense only represents old data in a new interpretive dress. The depositional contexts are significant, and in most cases may be regarded as intentional, but not necessarily permanent as in the case of the enormous and enigmatic hoard of Nahal Mishmar, which we have already discussed. However, it clearly gives us ideas of how people used and gave value to the metal objects. Metal, and especially copper, has been regarded as the prime mover towards complex and civilized societies for a long time. It has been used as indirect evidence of occupational specialization and artisans. Considering the nature and the depositional contexts in these periods may therefore give some input to the development of more complex societies and the role of metal in these formative phases, as well as interregional contacts.

It must be considered that the metal was exposed to grave robbers and to general decay; it was re-melted and lost through the millennia. This is a methodological problem with this type of material, and it is difficult to avoid. An advantage is that metal of the 5th and 4th millennia is still not yet 'common' in these pre-urban societies, and the nature and the contexts of the sites may be an advantage in this case. One must expect that there are artefacts in private collections and museums, which have not been published. Furthermore, robbers have pillaged the Levant, Nubia and Egypt over centuries—if not millennia.

Chronology, Form, Function and Context of Copper Artefacts

The material originating in northeast Africa and the southern Levant and dated to the 5th and 4th millennia BC, represents finds over a large geographical area, but the artefacts themselves are now deposited in European or American museums, some are in their country of origin and some have been regrettably lost. It has not been possible, both in terms of time and access, to study all these objects individually. To a large extent, this section is based on the original publication material from the sites, and where this is not possible, secondary publications have been considered. Of course this is a drawback, but early archaeologists had developed a tradition of relatively thorough descriptions of the artefacts themselves. Less attention was paid to the context and when it was unclear, it was noted. As for the artefacts, they are treated within the chronological frame they have been assign to by other researchers. As for the southern Levant, Egypt and Lower Nubia, they are placed within the frames of conventional

chronological framework, which has been discussed in the preceding chapters. It was not possible in this dissertation to examine an evaluation of each single context on a micro level, possibly altering the dating of some of the finds. This would have strengthened the case, especially with reference to Predynastic Egypt. Here, all copper is divided into Naqada I, Naqada II or Maadi (Lower Egypt), although a finer resolution could have been possible. Placing objects within a context or a typological scheme, as well as using previous and old excavation reports, is to a large degree based on interpretation.

The hoard of Nahal Mishmar in the southern Levant is included in the first analysis, although it represents an anomaly as argued earlier. In the next chapter the hoard is omitted based on the previous discussions.

In order to make a useful classification scheme, relatively simple categories of the different copper artefacts have been used. These have some functional 'guidelines', although this is not the intention. The total repertoire of copper artefacts cannot, under any circumstance, be described as varied, though with some variation during the Chalcolithic in the southern Levant. The following categories have been used:

Awls: small pointed tools for making holes, often in wood or leather. This also includes fragments of awls, often described as pins, needles and wires.

Blade objects: artefacts with a flattened cutting edge, usually part of a knife, adze, chisel, sword or spearhead. The latter could also be interpreted as a dagger, as there are no clear distinctions here (cf. Ben-Tor 1975:45, fig. 12, 4-6.).The spearhead would tend to be shorter and have a different manner of mounting, usually without rivets.

Daggers: have been excluded from the blade object group, though they could by definition also be placed here. However, the daggers here comprise relatively clear differences, with two-edges, short length and pointed tips.

Mace-heads: often large with heavy (ceremonial) staff or rod. In this category there are great variations, especially with reference to the hoard of Nahal Mishmar (cf. Bar-Adon 1980).

Standards: upright pole or column, often hollow and may resemble mace-heads. They have a more or less similar shape, though there are differences in decoration. Remains of wood have been found inside some of these. There are variations, but they have been used with reference to the hoard of Nahal Mishmar (cf. Bar-Adon 1980).

Crowns: it is doubtful if these are actual crowns, but they do have the shape and decoration that makes the association. In this category there are great variations, especially with reference to the hoard of Nahal Mishmar (cf. Bar-Adon 1980).

Miscellaneous: copper objects with various characteristics not easily classified. This group also consists of uncommon objects, including fishhooks, fragments, rings, beads, bracelet, lump, harpoon, vessel, bowl, etc.

The Southern Levant

The Chalcolithic Period ca. 4500–3500 BC

All the copper artefacts, dated to the Chalcolithic period of the southern Levant, have been found within the modern state of Israel and in the Palestinian Territories. Except for the copper artefacts from Ghassul, there are no other copper artefacts dated to this period from

Jordan. From an ecological point of view, this might be natural but these are issues addressed in the next chapter.

The metal artefacts found in Chalcolithic contexts have been divided into two groups (Moorey 1988b; Ilan and Sebbane 1989; Levy and Shalev 1989; Shalev 1994; Golden *et al.* 2001). Awls, chisels, axes and adzes are defined as functional and utilitarian artefacts for everyday use (Hanbury-Tenison 1986; Ilan and Sebbane 1989, and others). In actuality, many of these tools have probably never been used (Golden *et al.* 2001:951–2). There are about 60 to 70 artefacts in this category (Shalev 1994:633, mentions 66 working tools; Levy and Shalev 1989:360, mention 52—leaving out 13 miscellaneous finds). The important factor to be considered here is that they are all made of relatively pure copper and have probably been cast in open moulds of either stone or clay (Shalev 1994:633). It has therefore been suggested that this group of artefacts was made locally, at sites in the Beersheba region (Moorey 1988b; Ilan and Sebbane 1989; Levy and Shalev 1989), where Feinan has served as a possible source of copper ore.

The second category is defined as 'ritual, cultic or prestige' artefacts and includes mace-heads, sceptres, crowns, etc. In total, this category accounts for between 410 and 420 artefacts, whereas the items from the hoard of Nahal Mishmar account for 400 alone (Levy and Shalev 1989:360). The Nahal Mishmar hoard has been subject to a wide variety of interpretations (see for example Ussiskin 1971; Amiran 1985; Moorey 1988b; Levy and Shalev 1989; Gates 1992, and others). Excluding the hoard of Nahal Mishmar, the majority of the prestige or cultic objects are found in the Beersheba region (a total of ten according to Levy and Shalev 1989:360, table 2), while five objects are found in the Coastal Plain and the Judean Desert (Levy and Shalev 1989:360, table 2). All these items contain arsenic copper to a varying degree, suggesting that they were imported because no copper ore in the region is known to contain arsenic. On the basis of this, Armenia or Azerbaijan have been suggested as the closest known arsenic copper ore, although we should not exclude the possibility that arsenic was deliberately added. As Hanbury-Tenison (1986:159) points out, there is not much consistency in the arsenic content, which would be expected if it were intentionally added. Several argue, but do not rule out, the possibility that the hoard and its objects were made locally (Hanbury-Tenison 1986:158–9; Moorey 1988b; Levy and Shalev 1989, and others). This is based on the idea that these artefacts were produced outside the habitation sites, although there is no such evidence. It is therefore questionable whether such an idea can be pursued.

Several researchers have partially considered the context of copper artefacts from the Chalcolithic period. Levy and Shalev (1989) and Ilan and Sebbane (1989) have focused mainly on the distribution of copper artefacts, but only to a minor extent considering the contexts. More recently, Golden (1998) has analysed the social complexity and the rise of copper metallurgy in the southern Levant, briefly considering the contexts of what he defines as complex castings. He divides the context into three groups, although the appropriate contexts may be questioned:

- Foundation deposits—such as at Shiqmim, where mace-head and standard was found below the stone foundation of a dwelling.
- Small hidden caches—such as at Neve Noy, where a number of copper artefacts was found together.
- Caves—burials. Golden follows Garfinkel's interpretation that the hoard of Nahal Mishmar may be considered to be a burial.

Several copper artefacts have been found at Abu Hamid on the Jordanian side of the Jordan River, including needles or awls and a piece of copper (Kerner 2001:136, with reference to Hauptmann *et al.* n.d.). This has not been included because the publication from the excavation is not yet finalized. Another site in the far south of Jordan close to Aqaba, is Maqass, where several copper artefacts and slag have been found (Kerner 2001:136, with reference to Khalil 1988, 1995, see also discussion above), but it seems to be of EB I date, according to the material.

Awls: this artefact type is generally described as functional. The division and discussion of whether these are purely functional tools will be taken up later. Ilan and Sebbane (1989:144) note that only 17 complete awls have been found at Chalcolithic sites. They further suggest (1989:146) that the scarcity of copper awls in the Chalcolithic must be seen in connection with the abundance of flint awls, concluding that the scarcity was partly due to their 'expense'. In their study from 1989, they found that there are typological differences between the Chalcolithic awls and the later EB I awls. Ilan and Sebbane (1989) clearly illustrate that the Chalcolithic awls have a rounded cross-section, suggesting this is related to technological aspects of smelting or hammering the copper.

Of importance here are some of the awls found at Shiqmim, where one complete awl was found in area D, square Q/9, L.02604, on the floor of Room 6 with a sheep/goat bone handle, and two additional awl points alongside this. It is possible that some of these belong to the same awl. The awl found at Bir es-Safadi was also set into a bone handle. This was found next to a pile of haematite mace-heads, elephant tusk and large fragments of ivory female statuettes. The location was interpreted as an ivory workshop by the excavator (Perrot 1956:126). The contextual relation here clearly indicates that the awls are not necessarily purely working and functional tools. The bone handle is not that common in the southern Levant, although this may be due to natural processes, but that handle type is well known from Predynastic Egypt and the Nubian A-Group (see below).

A total of 22 copper awls have been found at eight different sites, where one awl seems to be the most common artefact (Fig 6.2). However, a special feature is that both Shiqmim and Ghassul are plainly different from the rest, with seven and eight awls respectively. There are some uncertain issues concerning the actual number of awls, and in the case of Ghassul,

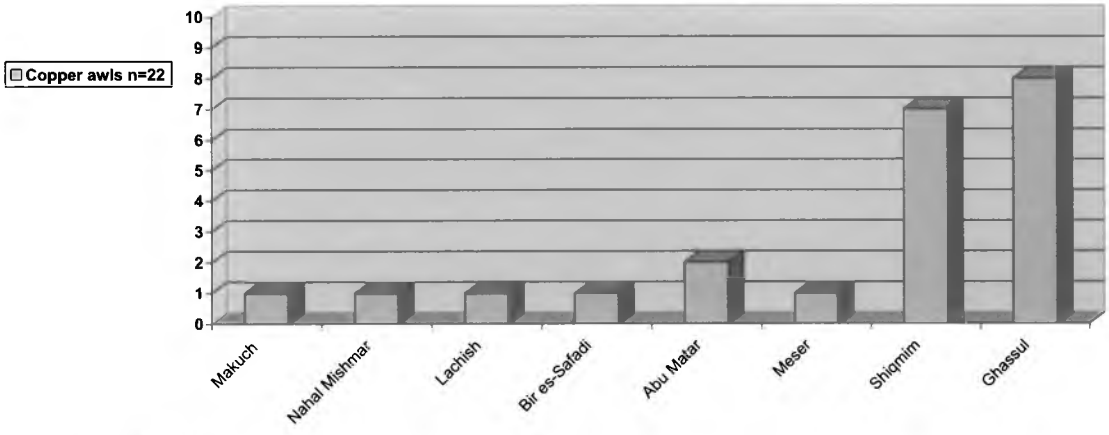


Figure 6.2 Number of awls and sites from the Chalcolithic period.

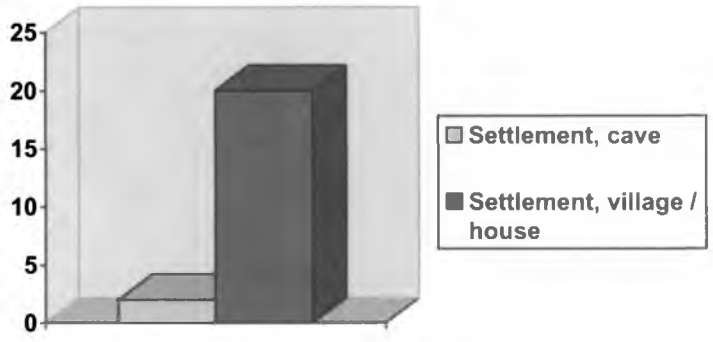


Figure 6.3 Awls and contexts from the Chalcolithic period.

several of the fragments may represent one awl only. Also at Shiqmim, it is possible that some of the fragments may stem from the same awl. In any case the awls probably give a representative picture of the total number of awls and their geographic distribution. Giving ritual or cultic significance to the awls and the possibility of sites, such as Shiqmim and Ghassul, being cultic centres seems to have a relatively apparent correlation. Furthermore, as awls are also found at other sites, the functional aspects of awls are not ruled out. The excavators of Neve Noy in the Beersheba region (Eldar and Baumgarten 1985:137) mention copper awls, but references to amount or context are omitted.

Looking at the contextual breakdown, there are also some interesting features (Fig. 6.3). The overall majority of the awls is found in settlement contexts, i.e. in habitation areas, while one is of unknown context and one is from a cave context. This means that they are found within the habitation area, the immediate vicinity, or in the actual structures of the house. Interestingly enough, no copper awls have been found in grave contexts, which is relatively common in both Predynastic Egypt and the Nubian A-Group (see below). The context of Meser is disputed, but on the basis of the cross-section of the awl it is likely that it belongs to the Chalcolithic period, although it is not mentioned by either Hanbury-Tension (1986) or Levy and Shalev (1989). The awl found at Lachish may stem from an EB context but on the basis of the cross-section and earlier evaluations of the context, it is here placed within the Chalcolithic period. One awl has also been found at Makuch, but there is no further contextual information on this.

Blade tools: these do include earlier classifications, such as chisel, axe, adze, etc, which are all within the utilitarian or functional domain. The most important feature is that the artefact has some kind of blade, which may be used for cutting or other functional operations. Whether these are purely functional tools will be discussed later. On the basis of the chisels and axes found at Nahal Mishmar, Shalev and Northover (1987:361) suggest that these artefacts may have had a social and ritual value (Fig. 6.4). At Azor one chisel probably derived from an ossuary cave burial. One of the two chisels/axes from Bir es-Safadi was found in a subterranean house, the other elsewhere on the site. At Neve Noy, Ghassul, Shiqmim and Meser chisel/axes have been found in a settlement context. The dating at Meser is, however, disputed, but placed here according to the excavator. Several mention copper chisel(s) at Abu Matar, but there is no reference to number or context. At Nahal Se'elim, an axe was found together with a mace-head (Aharoni 1961:14). With 15 chisels and one axe Nahal Mishmar has the most. The Nahal Qanah cave is classified here as a burial context, although

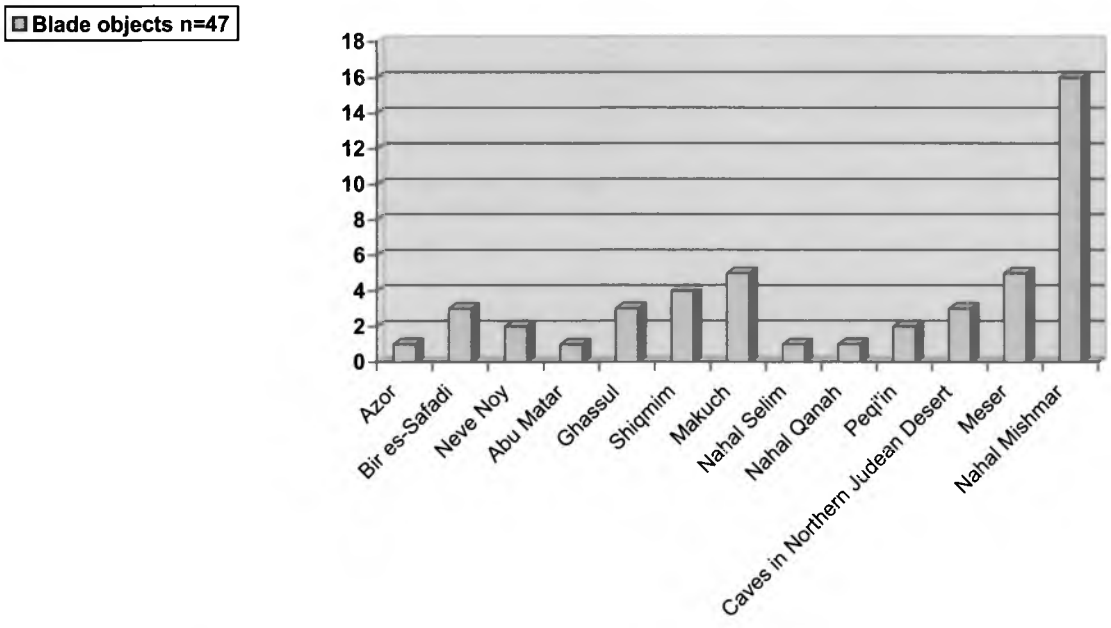


Figure 6.4 Sites with blade objects from the Chalcolithic period.

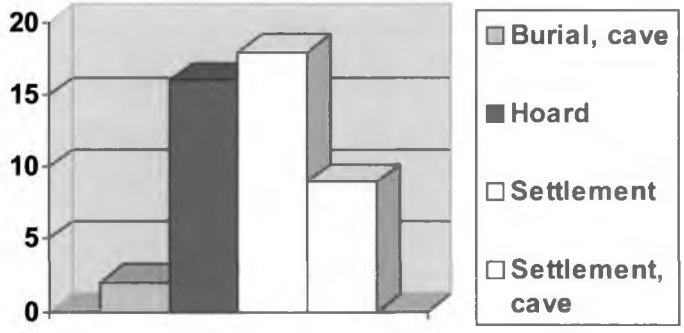


Figure 6.5 The context of the blade objects from the Chalcolithic period.

it may well have been related to either a habitation or a hoard as well. According to Miron (1992:23 with reference to Allegro 1956), an adze with a handle was found in a Chalcolithic assemblage at Nahal Muraba'at, but the type and the contextual circumstances are unclear and have been left out of the analysis.

The striking issue is the number of blade objects deposited in hoard and settlement contexts, which seem to be more or less the same (Fig. 6.5). In addition, there does not seem to be a common practice of placing copper artefacts in burials, or depositing them in habitation caves. If the hoard of Nahal Mishmar (16 blade objects) is omitted, the tendency to deposit the bladed items in a settlement context seems to be the same as with the copper awls. This tendency appears to be also found in caves and particularly in the Judean Desert.

Mace-heads: The mace-heads are generally polished and perforated, though with different shapes. Several had the remains of wooden staffs or poles inside the perforated hole of the mace-head (Bar-Adon 1980:116). The metallographic composition of the mace-heads seems

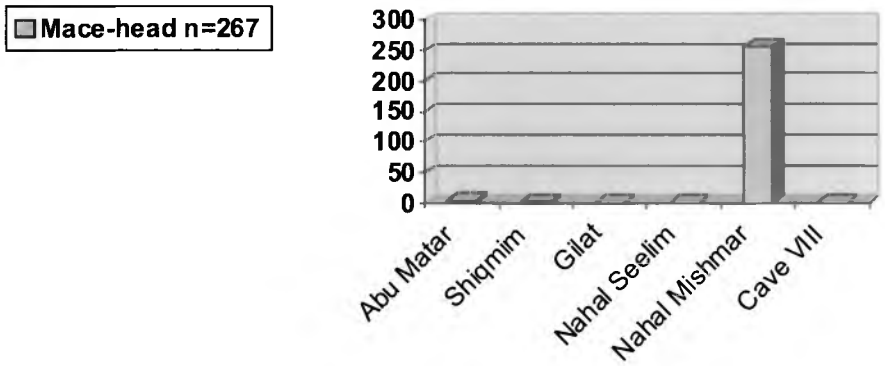


Figure 6.6 The number of mace-heads and sites from the Chalcolithic period.

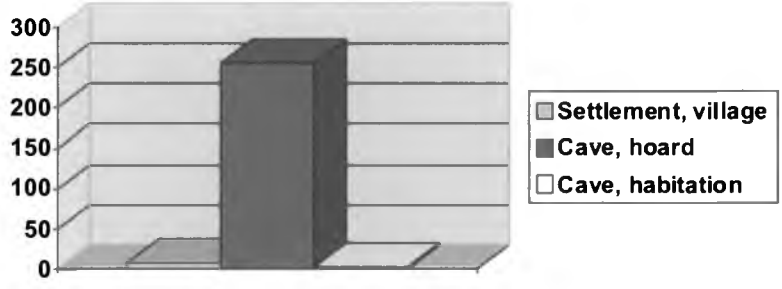


Figure 6.7 The context of the mace-heads from the Chalcolithic period.

to be the same, though with a variation in the arsenic content. They are generally regarded as cultic or symbolic artefacts. Objects defined by some researchers as sceptres are included in this category. The hoard of Nahal Mishmar comprises the large majority, however the discoveries of mace-heads both at Shiqmim and Abu Matar may support the anomaly of Nahal Mishmar (Fig. 6.6). Further, it gives a more varied picture of the contexts, although this is not supported by the amount (Fig. 6.7). In addition to the copper mace-heads found at Nahal Mishmar, six mace-heads of haematite and one of limestone were found in the same hoard. Mace-heads of this type of raw material are not uncommon at other sites dated to the same period (cf. Bar-Adon 1980:116).

No mace-head of copper has been found at Ghassul, and again the Beersheba region seems to be a centre with finds in what is defined as settlement contexts. In addition, the Judean Desert and the hills on the western shore of the Dead Sea seem to be an important area of preliminary deposition. Recently, a mace-head has been found during a survey in a cave of the Northern Judean Desert in the vicinity of Jericho (Cave VIII).

Although there are only a few mace-heads found at the sites in the Beersheba region, this should clearly underline the importance of these sites. The contextual relations are not clear for the mace-head found at Gilat, though possibly a cultic relation of these objects. No mace-head has been found at Ein Gedi, although several have suggested a connection between Ein Gedi and Nahal Mishmar.

Standards: In general these are quite similar to the mace-heads, but they most often have some kind of metal shaft. However, as some of the standards are hollowed in the shaft

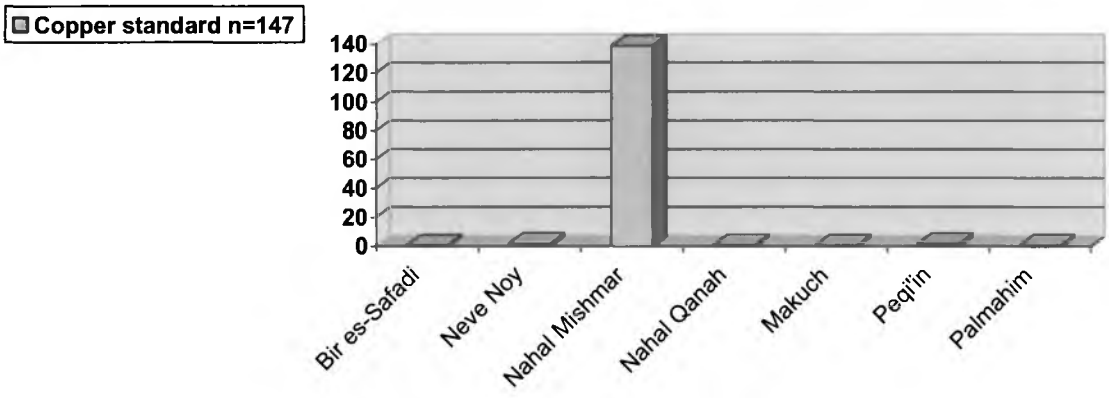


Figure 6.8 The number of standards of copper and sites from the Chalcolithic period.

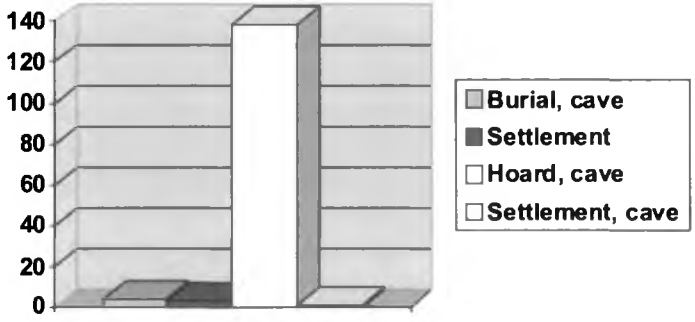


Figure 6.9 The context of the standards from the Chalcolithic period.

and a few have organic remains, it is possible that they have also been used with a wooden shaft. From Nahal Mishmar this category is quite numerous (Fig. 6.8). All differ in size, but several have similar decoration and Bar Adon (1980:40) suggests that they might have been used for processions. Again, it is evident that standards are found in a settlement context, as with the mace-heads, also illustrating their apparently more 'normal' context (Fig. 6.9). One major difference is that four standards are deposited in burial contexts in caves. One copper standard of Nahal Mishmar is similar to one found at Tepe Gawra, stratum IX (Bar-Adon 1980:40), and may possibly point to some links with the north.

Crowns: In the Nahal Mishmar hoard, ten copper artefacts classified as 'crowns' were found. Whether these are real crowns is questionable, but it serves as an adequate description. All the items are relatively similar in shape and most of them have decorative elements, such as knobs, bosses, grooves, zigzag lines, stars, animal heads or horns, birds and schematic human faces (Bar-Adon 1980:24). More recently, two other crowns have been found, one in the cave at Nahal Qanah in a burial context and the other in a settlement context at Neve Noy (Fig. 6.10 and 6.11). They were, however, extremely badly corroded and fragmented, but excavators interpreted as crowns.

Miscellaneous: The number of miscellaneous copper artefacts or finds is probably originally much higher. The reason for this is both due to excavation techniques, and the actual ability to identify small copper fragments. As well, this category also comprises artefacts, which are

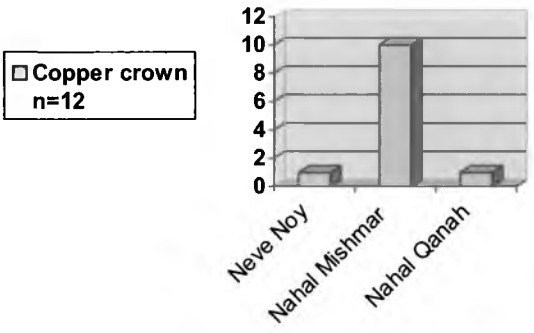


Figure 6.10 The number of standards of copper and sites from the Chalcolithic period.

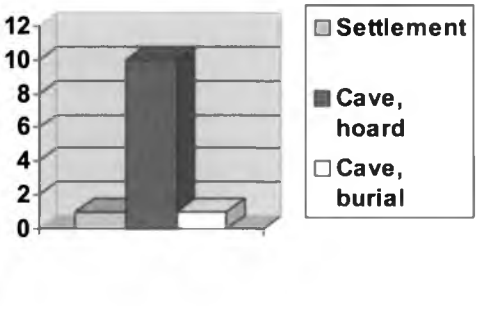


Figure 6.11 The number of crowns of copper and sites from the Chalcolithic period.

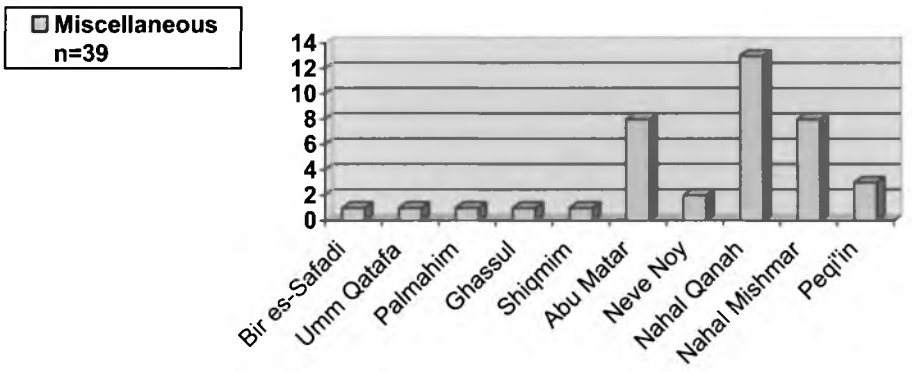


Figure 6.12 Sites with miscellaneous copper objects from the Chalcolithic period.

not easily placed into any of the other main categories used here, such as the rings, hooks, vessels and copper horns—the two latter stemming from the Nahal Mishmar hoard.

In terms of geographic distribution, there is no major difference compared to the other types of artefacts, all are basically found within the southern part of the region and are especially connected to arid or semi-arid environments, except for the ring from Palmahim (Fig. 6.12).

The miscellaneous artefacts themselves are not comparable, as they vary from sophisticated copper horns and vessels from the hoard of Nahal Mishmar to unidentifiable fragments and lumps of copper (Fig. 6.13). Rings, hooks and beads cannot under any circumstances be regarded as common items in terms of quantity. From several of the sites, lumps or beads of copper have not been quantified and it is therefore difficult to estimate their total number other than to say that that type of object was present at the site. It is noteworthy that the copper wires found in the cave of Nahal Qanah are found in Chalcolithic contexts for the first time (Gopher and Tsuk 1996:114). This type is in fact more 'common and well-known' in Predynastic Egypt (see below).

The contextual relations of the fragments do not give a clear picture, but this is due to the nature of this category, which comprises quite different types and contexts in general (Fig. 6.14). However, it seems to be significant that the overall majority of this type of find, regardless of type, is quite common in cave contexts whether is its burial, cave (unspecified), or a hoarding context.

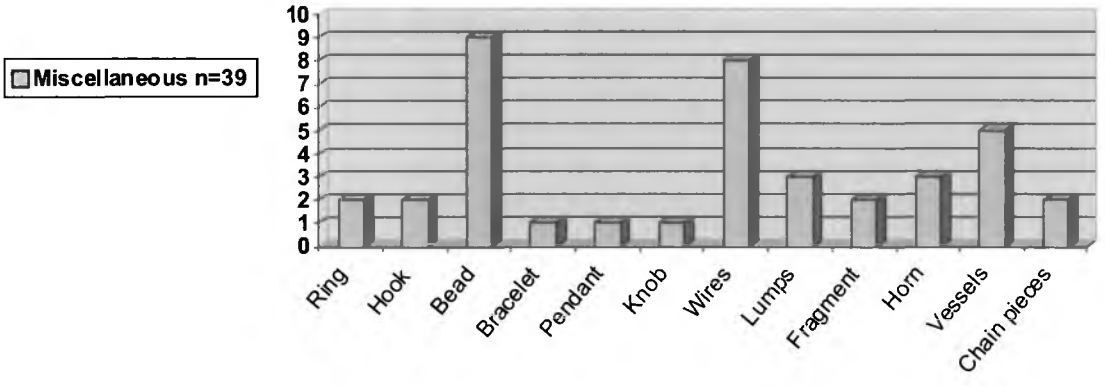


Figure 6.13 Types of miscellaneous copper artefacts from the Chalcolithic period.

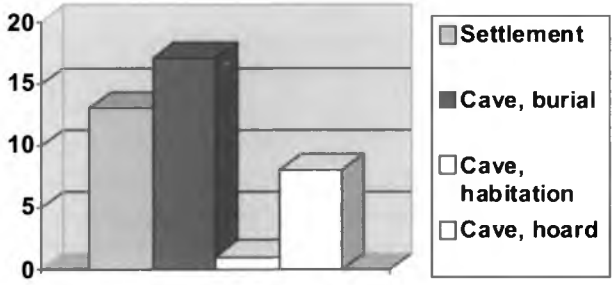


Figure 6.14 The context of the miscellaneous copper artefacts from the Chalcolithic period.

Usually, the copper artefacts of the Chalcolithic period may be described as quite varied in terms of type. There seems to be an emphasis on settlement and various forms of cave contexts with little emphasis on burial context. Geographically the copper artefacts are, for the most part, confined to the southernmost parts of the region and particularly to the Beersheba region.

The Early Bronze Age I ca. 3500–3000 BC

For some reason, the picture of the copper artefacts dated to EB I is dramatically different from the preceding Chalcolithic period. According to Ilan and Sebbane (1989:143), the distribution of copper finds 'spreads northwards' and the metallurgy in the Beersheba region disappears. Ben-Tor (1992b:90) has argued that the metallurgy of the EB I represents a decline, especially with reference to the preceding Chalcolithic period and specifically the hoard of Nahal Mishmar. As he further argues, the hoard is an anomaly, and leaving this out, one may trace some developments based on the Chalcolithic traditions. He also suggests some improvements and variations of northern origin, as well as continued production of tools already known in the Chalcolithic.

> Continuity between the Chalcolithic and the Early Bronze Age I is evidenced in the axes, adzes and awls, which are so similar in form and technique that no typological differentiation can be made between the earlier and the later objects. The difference between the two periods is shown in the marked decline in the distribution of the mace-heads so typical of the Chalcolithic and in the introduction of spearheads (Azor) and daggers. The latter, found in a number of

tombs, exhibit a variety of types, from the untanged dagger with a rhomboid section to the relatively developed type, with tang and midrib (Ben-Tor 1992b:90).

Silver and gold artefacts are also found in EB I, though the quantity and amount is not high. In addition to the copper finds at Azor, two beads of rolled gold, a silver coil earring, silver fragments and nearly 1200 beads (of limestone, rock crystal, quartz, agate, amethyst, chalcedony, jasper, malachite and carnelian) were found. A bifacial flint knife is ascribed to be of clear Egyptian origin (Ben-Tor 1975:24). In addition the perforated stone palettes have Egyptian and Nubian similarities with the exception of the perforated hole. At Tell Fa'arh North, a large silver cup with cylindrical base and parallels to Byblos and Jericho V (de Vaux 1951:587, pl.xxviia: fig. 13:1) has been found. According to Hanbury-Tenison (1986:155, with reference to Bade 1927:12), a gold ring and a gold cylinder bead, possibly belonging to Cave Tombs 5 and 6 were recovered at Nasbeh. With the exception of noting the presence of these metals, there will not be further consideration of them here.

The Bronze Age Cemetery at Gibeon, excavated by Pritchard (1963), is noted by Ilan and Sebbane (1989:143) to contain the copper objects of an EB I tomb. However, the text and the plates in the publication (Pritchard 1963:10, fig. 6) are not coherent. The text refers to the objects of a tomb of the EB, with the exception of Fig. 6, No. 15 and No. 22, while the text of Fig. 6 states clearly that all the finds are of EB pottery, excepting No. 15, No. 20-22, No. 24-25, scarabs and beads. The finds of one bronze ring, one possible crucible, one gold earring and a bronze dagger blade are not included in the list of the EB I copper artefacts. The copper item that Ilan and Sebbane refer to is in fact a gold earring and Hanbury-Tenison refers to a squat jug that may be a crucible (1963:10, fig. 6:23), although this is specified as a spouted jar and a possible crucible (fig. 6, and no.22) in the publication. Thus if the metal objects are considered to belong to an EB tomb, the pottery material has its closest parallels to sites such as Ai and Tell en-Nasbeh (Pritchard 1963:10).

Yeivin (1975:97) mentions that in area N at Tell 'Erani (Tell esh Sheikh Ahmed / El-'Areini), a group of copper scales that are fixed together were found. There is no reference to dating nor what kind of scales these are, except that they are similar to those found at Kfar Monash. No reference is made to the seven awls that Ilan and Sebbane (1989:148, n. 7) mention. Ilan and Sebbane (1989:143, n. 4) mention two copper items from Tell Erani and these are, according to Miron (1992:14), both axes of the simple blade type and both have been included here. However, it must be kept in mind that the dating of Tel Erani is controversial and not properly published. There is evidence of Egyptian influence on a sherd showing grafitti, possibly with the name of Pharaoh Narmer, and some cylindrical jars of the late Chalcolithic period. Thus, the picture of copper artefacts from the earliest part of the Bronze Age may change, as more is published on the subject.

Below the MB burials at Tell el-Asawir, two layers of graves from the late Chalcolithic period were mixed together. Several hundred vessels, many intact, and a number of skeletons and skulls were recovered. There were 64 vessels with human bones and the rest of the bones almost completely covered the floor. Burial offerings included beads, pendants, flint and stone artefacts, metal ('brass') rings, and vessels. As it has not yet been possible to verify the 'brass' rings, they have been left out of the analysis here. The vessels were dated to the last stage of the Chalcolithic period, were mainly handmade, and included jugs with a high loop handle, a red-burnished jug with spout and ribbed neck, a red-burnished pitcher in the

form of a gourd, a grey-burnished bowl, and a red-burnished bowl and pots with painted decoration (Dothan 1975:101–2). Dothan (1975:102) further argues that the vessel types have parallels not only with the late Chalcolithic Ghassulian and the EB periods, but also with Egypt (Gerzeh and Maadi) and Mesopotamia (Uruk). A pendant resembling a bull's head had a possible origin in Predynastic Egypt. Communal burials are also known from Mesopotamia and Egypt, and have parallels to Gezer and Jericho. Dothan (1975:102) suggests the dating of the 'late Chalcolithic graves' to *ca.* 3200 BC, on the basis of a comparison of pottery and a similar burial from Jericho dated by C-14. In other words, this is well within the range of what is now conventionally labelled EB I.

The dating of the hoard of Kfar Monash near Ma'abarot has for a long time been disputed, however, now most researchers agree that the hoard should be dated to the EB II or later It is therefore not included in the discussion here (Watkins 1975; Ben-Tor 1971; Hestrin and Tadmor 1963; Hanbury-Tenison 1986, with references).

A number of sites have not been published, but according to Ilan and Sebbane (1989:143, n.4), copper items dated to the EB I have been found. These sites have not been possible to verify and are therefore excluded here. This includes Abu Hof (unpublished according to Ilan and Sebbane 1989:143, n.4, refers to pers. comm. of D. Alon) and Small Tell Malhata (unpublished according to Ilan and Sebbane 1989:143, n.4, and the only reference is their fig. 7.1 (should be 5.1)). Ilan and Sebbane (1989:143, n.4) also mention Tel Ma'ahaz, with reference to their fig. 7.5, although there is no such figure in their article and it is therefore impossible to trace. In Sinai, there are also copper items dated to the EB I. These are, for the most part, awls found in the nawamis, especially at Gebel Gunna and 'Ein Huderah. Ilan and Sebbane (1989:146, fig. 3) also note copper items at Wadi Nasb, but these has not been possible to trace and are therefore omitted. It is taken for granted in this analysis that the awls referred to as Fig. 5.5, 5.6, 5.7 and 5.8 are the same as in fig. 8.3, and that all derive from the nawamis at Gebel Gunna (see below). In addition to the Nawamis mentioned in the tables with reference to 'Ein Huderah and Gebel Gunna, Ilan and Sebbane (1989:Fig.3) also mention that copper awls have been excavated at Wadi Nasb. However, there is no reference to this, nor are any contextual circumstances referred to so this find is therefore left out of the analysis.

It cannot be ruled out that some of the awls, such as those from Beth Shean, originally derive from a more recent level. However, both the axes and the dagger are typological similar to other axes and daggers dated to EB I.

Awls: The category used here also includes types and categorization such as pins and needles. Shalev (1994:635) mentions 47 EB I awls, but several of these sites have been categorized as either later or not possible to evaluate. Ilan and Sebbane's (1989) publication a few years earlier, mentions 35 awls, and here 39 have been included in the analysis. On the basis of Ilan and Sebbane (1989), all the awls have a squared or rectangular cross-section, which sets them apart from the round-sectioned awls dated to the Chalcolithic.

Awls are found at a number of EB I sites, though the most numerous sites having copper awls are Tell 'Erani and the nawamis of Sinai (Fig. 6.15). Although the geographic distribution seems to alter slightly from the earlier Chalcolithic, most of the sites are still connected to a dry or semi-dry environment, although there are exceptions such as Beth Shean south of the Sea of Galilee.

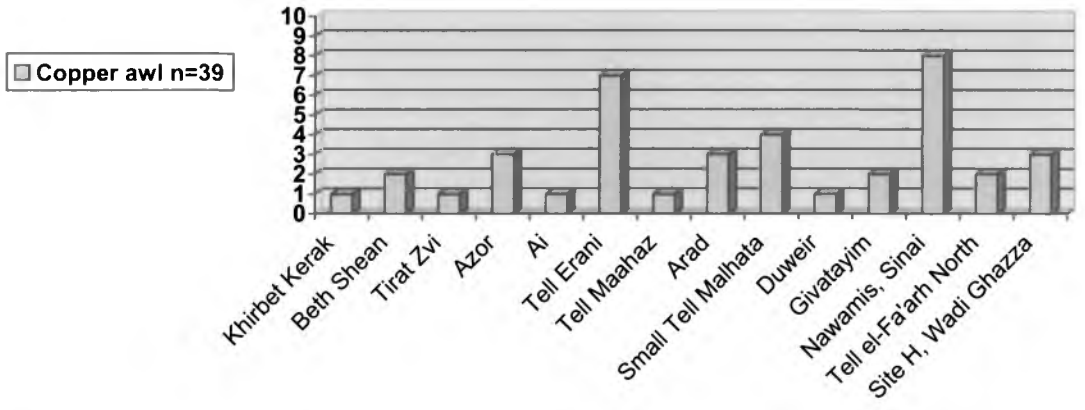


Figure 6.15 Sites with copper awls from EB I.

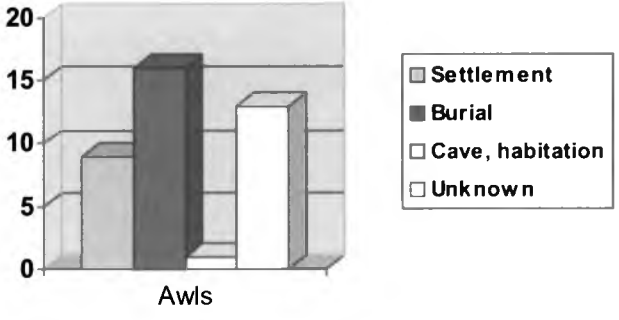


Figure 6.16 The context of copper awls from EB I.

In terms of quantity, there are more awls in EB I (39) than during the Chalcolithic (22). As the EB I period is about 500 years shorter than the latter, it is evident that there is an increase in number during EB I. There is in fact also a contextual change. During the Chalcolithic, awls are only found in settlement contexts, while during the EB I, there is a clear change in the depositional context towards graves (Fig. 6.16). It is significant here that the awls are also found in the grave contexts of the nawamis of Sinai.

Blade objects: This includes axes, celts, etc. Hanbury-Tenison (1986:157) suggests that the five adzes found at Meser may also derive from the EB Ia phase. Although this is inconclusive, they are here considered as Chalcolithic on the basis of the contextual circumstances of the finds. The EB I blades seem to be typologically different from the earlier Chalcolithic blade objects, such as those found at Ghassul, but there are no clear cut tendencies.

The copper blade objects do not have an obvious geographical distribution (Fig. 6.17). However, the majority of the artefacts are found in various parts of the Jordan Valley and adjacent regions, such as the Coastal Plain. However, when comparing the blade objects with the awls, it is striking that no blade objects (or other categories except the awl) have been found in the Sinai Peninsula.

Most of the copper blades seem to belong to a settlement context, although they are also found in grave contexts (Fig. 6.18). It cannot be ruled out that the objects have been left in these settlement contexts due to destruction of the site, etc. Very few of the blade objects seem

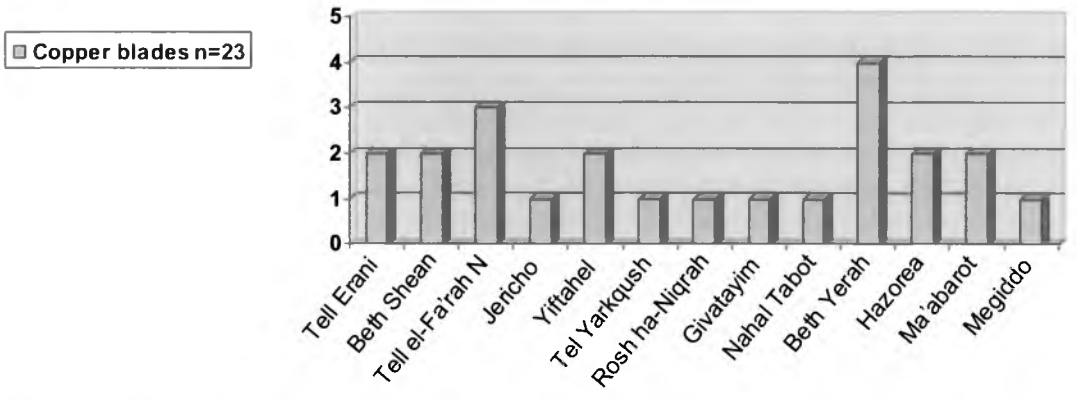


Figure 6.17 Sites with copper blades from EB I.

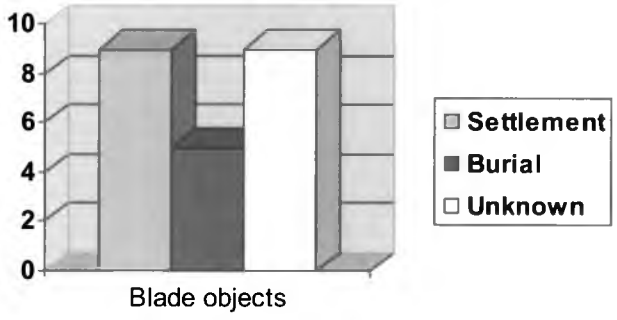


Figure 6.18 The context of blade objects from EB I.

to have been intentionally deposited, and may have been left or dropped unintentionally. The relatively large unknown category makes it difficult to draw any conclusive lines.

Daggers: As noted by several researchers, the copper dagger is a new artefact from the EB I repertoire.

As there are relatively few daggers, it is difficult to draw any clear conclusions. It is noteworthy, however, that most of the daggers are found in graves at sites which increase in importance in the succeeding periods—often developing into major urban centres, such as Beth Shean, Azor and Tell el-Farah N (Fig. 6.19). The increased deposition of burial gifts seems to follow the tendency of other EB I artefacts, as well as general tendencies in Egypt and Nubia with an increased focus on burials (see below) (Fig. 6.20).

Miscellaneous objects: This group consists of copper rings, a spearhead, some rivets, a point and some prills and fragments.

The miscellaneous artefacts themselves are not comparable and there are relatively few in contrast to the previous Chalcolithic period (Fig. 6.21 and 6.22). One must also expect that more fragments and miscellaneous objects exist than those illustrated here. The most common of these artefacts is the copper ring.

The contextual relations of the miscellaneous copper objects clearly indicate grave contexts (Fig. 6.23). Most of the objects are found relative to various graves, while the prills

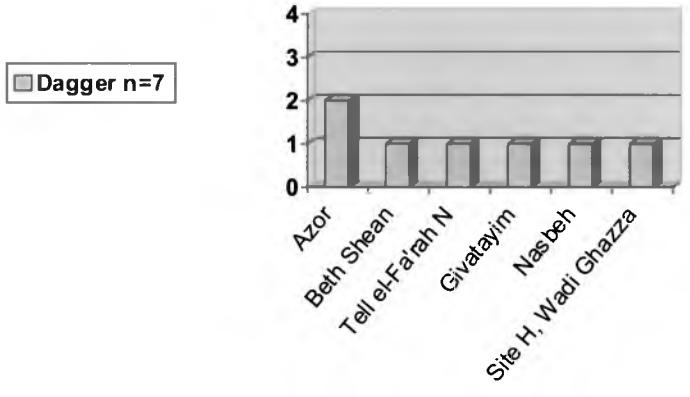


Figure 6.19 Sites with copper daggers from EB I.

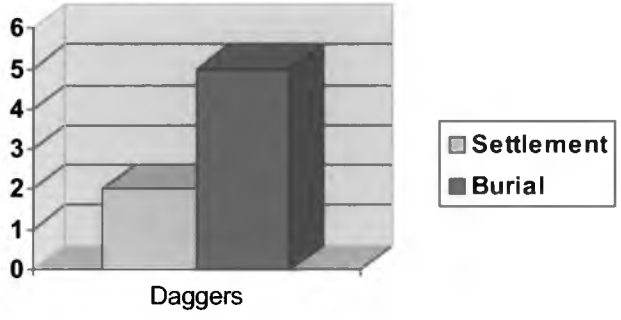


Figure 6.20 The context of copper daggers from EB I.

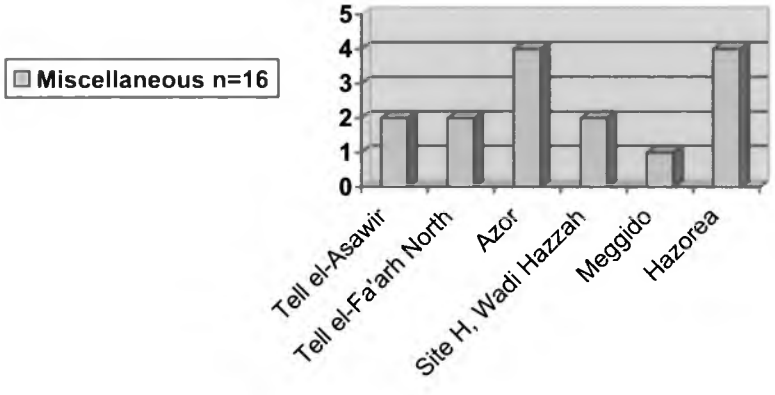


Figure 6.21 Sites with miscellaneous copper objects from EB I.

and fragments of copper have been found in a settlement context. As mentioned earlier at Shuna, these may be related to metallurgical activities at the site.

Hanbury-Tenison (1986:156) notes a great difference between the Chalcolithic and the Early Bronze Age, where the Chalcolithic is marked by extraordinary objects, such as those found at Nahal Mishmar and more jewellery objects found in the EB I. Likewise, he notes that the squat axe (No.163) from Nahal Mishmar is unusual and the exaggerated flaring edges of

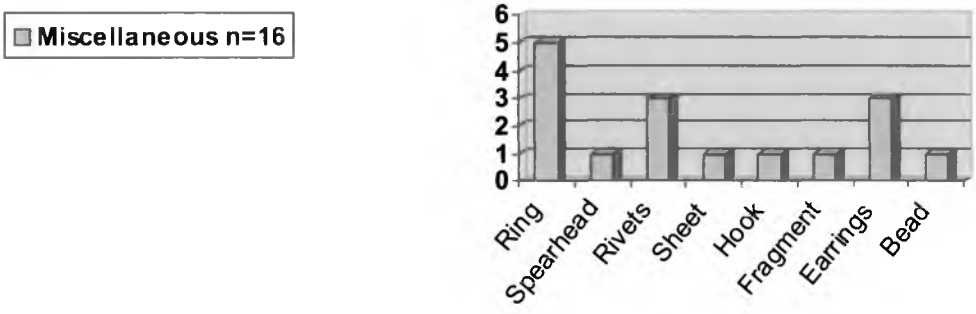


Figure 6.22 Types of miscellaneous copper artefacts from EB I.

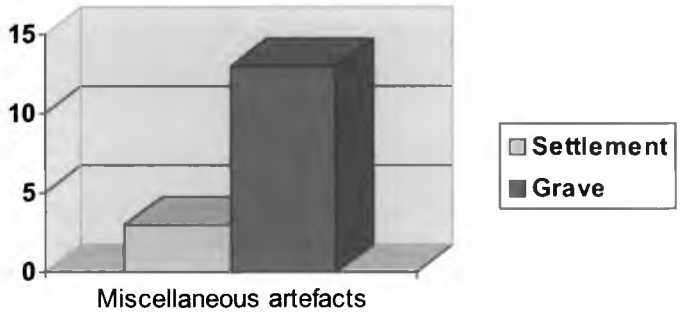


Figure 6.23 The context of miscellaneous copper artefacts from EB I.

the Beth Shean axes (with reference to Fitzgerald 1935:9, pl. iii:21, 23) are paralleled by the Nahal Mishmar axes, Numbers 167, 168 and 169. In addition, there is a great predominance of non-functional objects with an emphasis on collective use and storage, while in the EB Ib, he notes that the objects are almost entirely domestic, ornaments and weapons mainly found in graves or tombs. Hanbury-Tenison (1986:156) suggests communal ownership or possible use as ritual objects in the Chalcolithic period, which then shifts in the EB I. This is why, he explains, there was actually less metal in EB Ib, but it is likely that metal was more common in EB I than in the late Chalcolithic.

The copper items from EB I may well be recycled metal originating from the Chalcolithic period. Only a few analyses of items from EB I have been done with no conclusions drawn, although there seems to be similarities in composition between EB I and EB II copper items, suggesting a common source which Ilan and Sebbane (1989:148) attributes to Sinai. Ilan and Sebbane (1989:144) suggest on the basis of copper items that there are also changes in the technological process of casting. In the EB I only open moulds were used in comparison to the lost-wax casting known from the preceding Chalcolithic period, although there is no evidence for the lost-wax objects being produced in the region as argued earlier. Ilan and Sebbane (1989:144) further note a typological change in the copper awls from having round sections in the Chalcolithic, to having squared sections in the EB I (throughout EB III). They propose that this may also be connected to technological changes as, according to them, the round section is more time consuming and difficult to cast. They suggest, then, that neither the lost-wax method, casting in open stone moulds nor forging was performed.

As noted by Ilan and Sebbane (1989:143–4), copper seems to spread northwards in EB I, and there is sparse evidence of smelting or casting except for a few broken crucibles and

slag fragments. They suggest that the smelting during EB I was performed near the mines and that only the finished products were sent to the north. According to Hanbury-Tenison (1986:151), there is less metal in EB I, but the incidence of deposits is higher than in the preceding Chalcolithic period. As they are more or less all functional, he therefore sees a normalization of the metal. He further notes (1986:157) that the importance of metal seems to be low compared to Byblos and there are few indications of external relations suggesting a cultural autonomy. This view is opposed by Perrot (1968:441; 1984:80), Miroschedji (1971:86) and Bar-Adon (1980:201), who focus on external contacts. Hanbury-Tenison (1986:151), on the other hand, argues that the lack of evidence for complex foreign contacts (ruling out technology and artistry) points instead to the opposite direction.

In conclusion the EB I copper artefacts exhibit a change in the depositional context. A new type of artefact, the dagger, is recovered during EB I, otherwise there is less variation. Though most of the copper artefacts are still confined to the southernmost part of the southern Levant, geographically there is a slight change as now no finds are recovered in the Beersheba region.

Egypt

Neither gold nor copper occurs in the Nile Valley proper, but during the Dynastic periods it appears, as already mentioned, that it was mined in the mountains between Egypt and the Red Sea. It is highly doubtful if copper was mined in the Predynastic period as maintained earlier, although Baumgartel (1960:1) argues that gold might have been mined as early as Naqada I and II. At Fayum, no copper artefacts have been discovered in the prehistoric levels, and as the excavators noted not even a single trace of metal or malachite was discovered (Caton-Thomson and Gardner 1934:34), with the exception of finds from the more 'recent' periods, such as the Old and Middle Kingdom.

Badarian and Naqada I

> Until more work has been done in the field, the chapter on earliest Egyptian metallurgy must remain very unsatisfactory (Baumgartel 1960:3).
>
> All the objects previous to the middle predynastic are rare, small and flimsy... (Lucas 1962:200).

The earliest and the only dated copper objects have been found at Badari in an untouched grave of a child (Brunton and Caton-Thomson 1928:12, t. 5413, pl. L, 86 W 3), in addition to a pin from a plundered grave that must have also belonged to the Badarian period. As Baumgartel (1947:22) notes, copper was known in the Badarian, though it is not possible to describe it any further than vague knowledge of copper and its properties. This is in fact the earliest evidence of copper in Egypt and there are no indications that it was known earlier than this, or if there was any knowledge of the source of copper. Baumgartel (1947:34) points out that metal is still very rare during Naqada I and only copper pins made of wire with their heads turned back making a loop are known. Petrie (1920:26) suggests these are 'prick points'. Needler (1984:21) argues that the copper from the Badarian period may have been smelted and obtained to the south of Badari in the Eastern Desert. However, the quantity and the nature of the artefacts make this less likely. Needler (1984:21) argues that the smelting of copper was known earlier in Upper Egypt than in the Delta, but there is no evidence indicating that this was done. The quantity of copper known from the Badarian

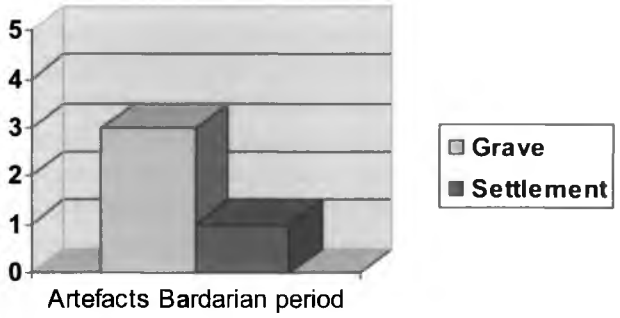


Figure 6.24 The contexts of copper artefacts from the Badarian period.

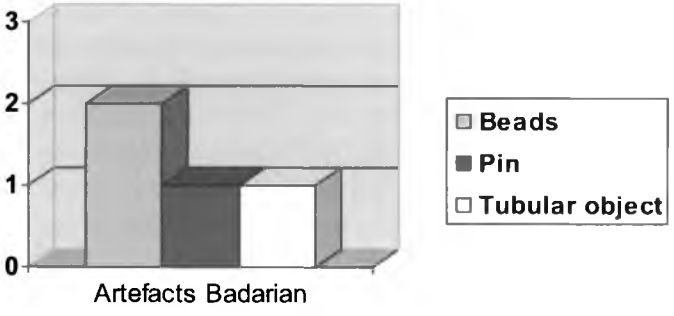


Figure 6.25 Types of copper artefacts from the Badarian period.

period makes this even less likely. Copper artefacts are only found in a very limited quantity in Badarian contexts and it is therefore impossible to draw any interpretation or conclusions from this. The most significant factor is that copper is present and invested in graves and this clearly illustrates that the metal is known, though on an extremely limited scale and that it is not easily accessible (Fig. 6.24).

Baumgartel (1960:2) argues that the beads and the rod from the Badarian are hammered copper. Brunton and Caton-Thomson (1928:41) suggest that the copper borers were much prized, perhaps for the piercing of the steatite beads. However, there are so few recovered that they must have been exceptionally rare and exotic. They further suggest that copper must have come from the north, although nothing was specified at the time. For the present, it is not possible to draw any greater interpretations from the types of artefacts represented (Fig. 6.25).

Consistent with Baumgartel, during Naqada I, copper artefacts are still rare only numbering five objects. The only copper artefacts that stem from the Naqada I period are all from grave contexts. The copper pin (Baumgartel 1960:2, pl. III, 14) is pointed at one end and looped at the other. It is interpreted to be a dress pin used to hold a garment together, prick pins, or used to attend to personal toilette. There are similarities, according to Baumgartel, to pins of ivory and bone, all long and fragile, used as hairpins with some even found *in situ* in the hair. Baumgartel (1960:3) acknowledges that copper must have had a great value, and if it was deposited in graves plunderers could easily remove it, which was a common occurrence in Predynastic times. She further suggests that copper might have been imported in small quantities from abroad, or that the copper pins were imported ready made. Similar pins are also known from Sialk I, Hissar I,6 and Shah Tepe in Iran.

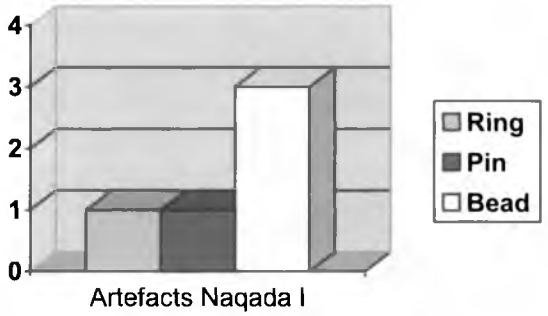


Figure 6.26 Types of copper artefacts from the Naqada I period.

It is likely that all the metal found in the Badarian and Naqada I has been hammered and not been exposed to any heat treatment, but it is not known where the copper came from. On the other hand, there are no moulds or smelting installations known from Naqada I. In general, the picture of copper artefacts is scarce and it is difficult to draw any comprehensive conclusions, though it is worth noting that Naqada was introduced to copper relatively early (Fig. 6.26).

Naqada II

This period had a much greater variety of copper tools than the previous periods. Additionally, gold and silver were well known, but examples of these are few (Baumgartel 1960:3–10). Gold artefacts are exemplified by finger rings, beads, pendant, handles, etc., which are often found in graves described as comparatively rich. Some of these also contain lapis lazuli, malachite, agate, etc. Some objects are also made of silver, such as rings, beads, spoons, axes, bowls, daggers and a statuette. All these must have come from afar, as silver has to be melted from the ore and all the objects stem from graves that are comparatively rich. The beads of precious metals are most often hammered from very thin foil and laid over a core of plaster or something similar. The few solid beads found still give an indication of the personal ornaments of the richer graves (Baumgartel 1960:8).

According to Petrie and Quibell (1896:14), copper is rare at Ballas. One hollow knob with projecting pins inside was found in a large tomb (100). In addition, two adzes, one of which was broken, were also found, although there is no reference to which tomb they belong. Only five adzes were found in the more than 3000 graves at Naqada. Consistent with Baumgartel (1947:42), the small chisel is now more prominent (cf. Petrie and Quibell 1896:LXV.9-11), suggesting this is some kind of toilette implement rather than a woodworking tool. Adzes are a new feature of this period, while Baumgartel (1947:42) argues that copper axes are not known until the Dynastic period. As in the case of Maadi, because there is no evidence of stone axes it is not possible to suggest that copper axes were in use. This conclusion is based on negative evidence and cannot be taken seriously. Although Maadi may well have been connected to the initial stages of copper production and transportation of ore from other regions, this does not explain why there are no stone axes and the reason should have socio-economic and cultural reasons, rather than anything else. Baumgartel (1947:42) argues that the adzes in copper do not have forerunners in flint in earlier Predynastic periods in Egypt, suggesting that the adzes may therefore have been imported during the Naqada II period. She also proposes that the adzes are not working tools, but are used as weapons instead,

being the forerunner of the Egyptian battle-axe (Baumgartel 1947:43). New inventions, such as the use of metal, are much more apt to be utilized for war than for peaceful means, according to Baumgartel, suggesting that the pear-shaped mace-heads of Naqada II are also weapons, as these were unknown in Naqada I. During the very late Predynastic period and the early Dynastic period, the copper inventory in a number of important graves seems to change, becoming richer with more elaborate types. This includes grave sites at Tarkhan, Sakkara, Hierakonpolis and Abydos, though they are not included in the analysis here. It would have been a great advantage if the copper objects had been given a more precise and exact dating, making the resolution of the introduction of copper to the Nile Valley clearer. A more detailed study of the dating of each single context is beyond the scope of the analysis here. However, Naqada II and III essentially cover the latter half of the 4th millennium, broadly corresponding to the EB I of the southern Levant. This makes it possible to compare Naqada II and III with the southern Levant and Lower Nubia.

Awls: This category comprises a wide range of different descriptions, such as copper pin, sewing needle and borer. Some of these descriptions are more suitable than others, though as a common type they have all been described as awls, despite smaller typological differences. Petrie (1917:52) notes that the borers, pins and needles are just used as expanders for forcing and enlarging holes in skins, and it is not until later that the advantage of a square form to cut a larger hole is adopted. This fits effectively with Ilan and Sebbane's (1989) observations on awls in the southern Levant, which have round sections in the Chalcolithic period and square sections during the Early Bronze Age. Petrie (1917:52) further suggests that the pin may be regarded as a prototype of the borer. In Egypt, the copper pin with the loop head is found in the oldest graves known, S.D. 30.

From the 54 copper awls recorded here, the Naqada region seems to be an area of early accumulation of copper awls. In quantity it is quite different from around Badari, Hemamieh and Matmar, all of which have relatively few compared to the Naqada region (Fig. 6.27).

All the copper awls from Hemamieh come from a settlement context, except for one found in a plundered grave together with a rippled knife of translucent flint, a pear-shaped mace-head and a limestone vase. The awls from the settlement context derive from different

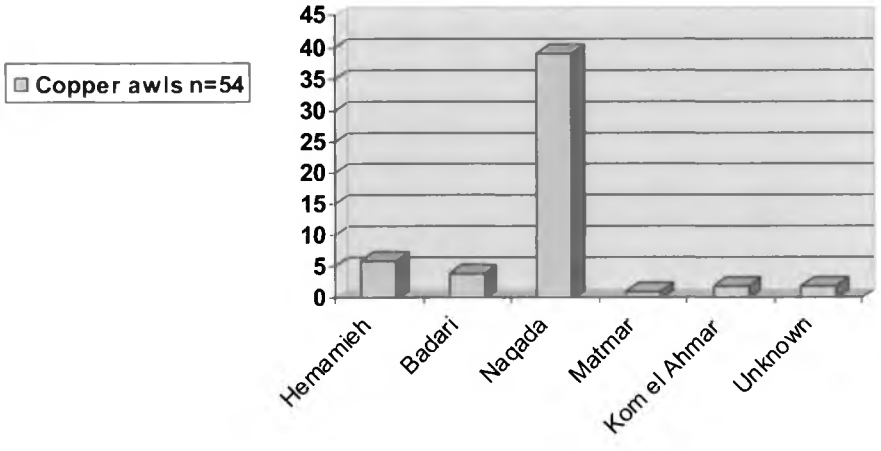


Figure 6.27 Sites with copper awls from Naqada II period.

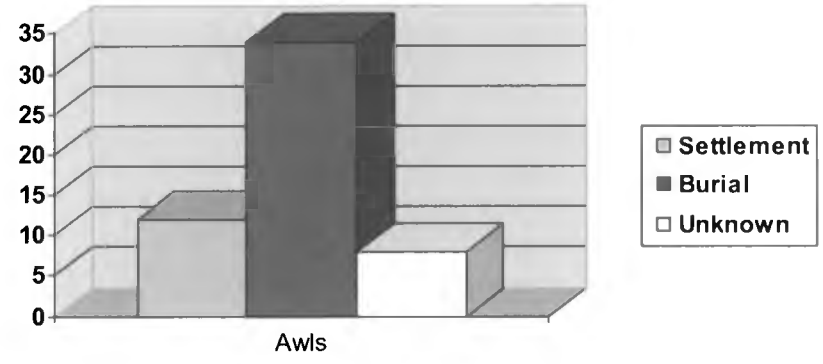


Figure 6.28 The context of copper awls from Naqada II period.

areas of the North Spur at Hemamieh. The overall majority of the copper awls found at Naqada are found in grave contexts (Fig. 6.28). In addition, two copper awls were found in a settlement context at Kom el Ahmar.

Blade objects: This category is less homogeneous and includes what is described as adzes, axes, chisels and knives. The knives may well have been placed in the category of daggers as there are minor differences between the two, though the initial description is kept. These descriptions are also kept in the table and diagrams, to ensure that the original meaning and content is not lost (Fig. 6.29).

The spearheads are, as indicated by Baumgartel (1960:11), very rare, while the adzes are not as infrequent as the daggers. The adzes are of a similar type to the one in silver, or vice versa. Baumgartel uses the division established by Petrie for the adzes from Naqada, and divides the adzes into two different types. Type I is described as rectangular with a thin straight neck, a straight cutting edge, bevelling on one side and with parallel sides. Type II, on the other hand, has a splayed cutting edge and is bevelled from below. There is some confusion about the definition of adze vs. chisel, though in this case they are all described as blade tools. Baumgartel (1960:13) argues that all the adzes were cast and then hammered. While axes are extremely rare, only one axe from Naqada II was known until the late 1950s. Baumgartel (1960:14) maintains that towards the end of the Predynastic period and the beginning of the First Dynasty, copper axes become more frequent, but they differ in type from the Matmar axe, which seems more developed and is interpreted as a 'carpenters' axe

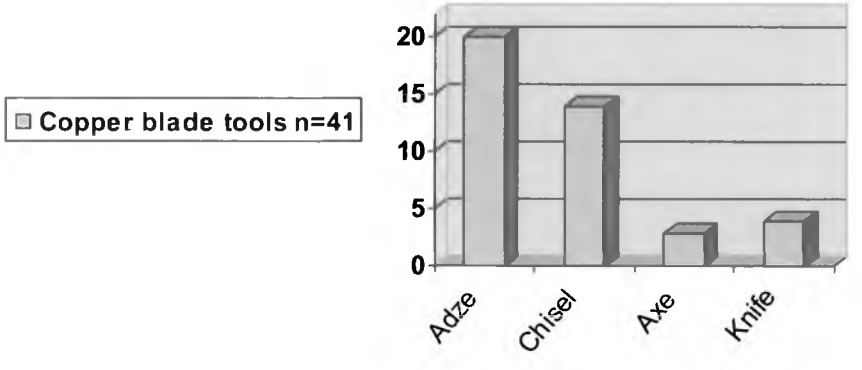


Figure 6.29 Types of blade tools from Naqada II period.

for roughing out a piece of furniture or the planks of the very coffin under which it was found (Baumgartel 1960:13).

Baumgartel (1960:15–16) divides the knives into two main types: the single-edged and the double-edged. Of the first type, there are two sub-groups, namely, a narrow straight-backed form with a tang, and the other, a form with a wide tanged blade and a square tip. The second blade type is similar to the silver blade mentioned from Homra Doum. Although Petrie called them 'flaying knives', Baumgartel (1960:16) doubts if these knives have been put to use at all.

Considering the copper chisels found at Naqada, Baumgartel (1960:17) argues that they are the most frequent metal objects of Naqada II in general, and notes that chisels are often found together with copper pins, suggesting they are also toilette implements. She argues it is odd that an ivory or wood-carver would take tools to the grave, while other artisans normally do not do so. This may in fact suggest instead that the tools are mere symbols and used for ritual purposes, rather than functional items in a strict sense. The combination of chisel and pin (awl) in particular may strengthen such an interpretation.

Like the awls, it is evident that the majority of the copper blade tools come from the Naqada region (Fig. 6.30). Other sites with blade tools all have a comparatively low number of objects. However, similar to the awls, the copper objects are all chiefly located in Upper Egypt.

All copper blade tools are found in grave contexts, except those which were not possible to verify and the two from El-'Adaima, which were found in a settlement context (Fig. 6.31). As there are few blade objects found in settlement contexts, this may be due to either the nature of the sites, or that they are now buried deep in the alluvial deposits from the Nile River.

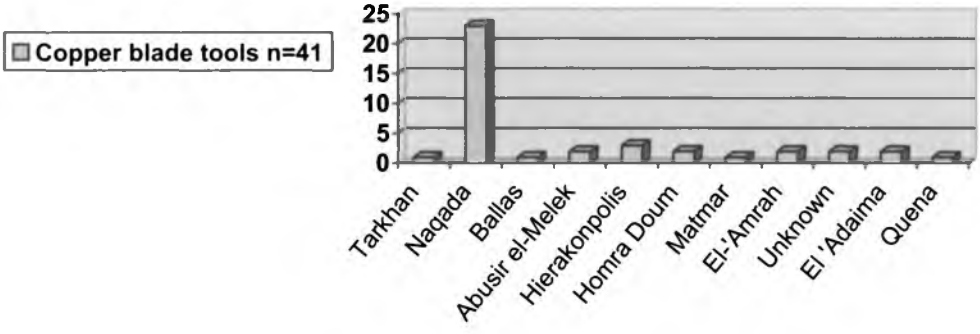


Figure 6.30 Sites with copper blade tools from the Naqada II period.

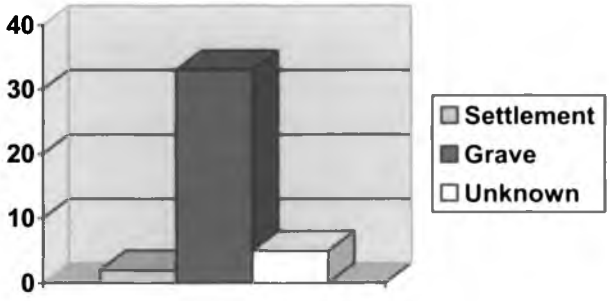


Figure 6.31 The context of copper blade tools from the Naqada II period.

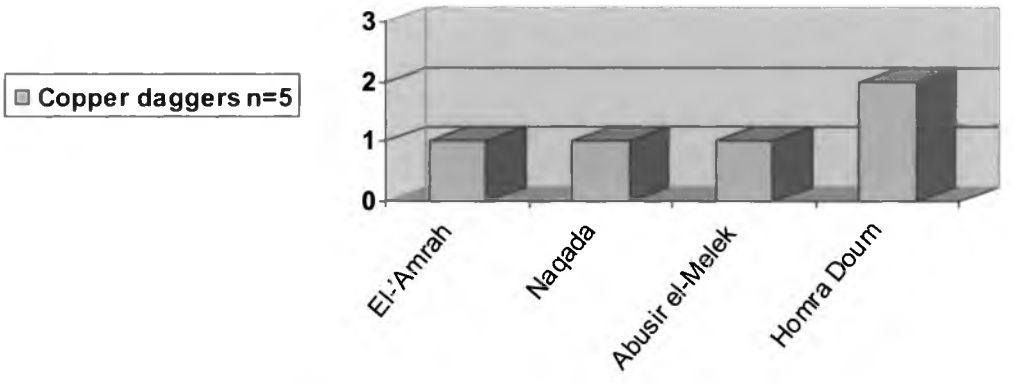


Figure 6.32 Sites with copper daggers from Naqada II period.

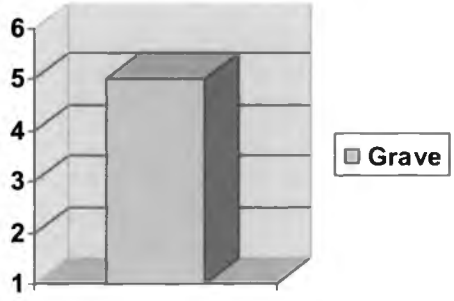


Figure 6.33 The context of copper daggers from Naqada II period.

Daggers: According to Baumgartel (1960:10), copper daggers are very rare in Predynastic Egypt and only one specimen corresponds in type to the silver daggers. She does not account for the dagger fragment found at Abusir el-Melek, and counts four daggers. Three of these (two from Homra Doum and one from El-'Amrah, note: Baumgartel mentions the opposite) are of the same type, with one rivet hole and dated to S.D. 50–63. The fourth has two rivet holes and is long and narrow.

It is not possible to draw conclusions from the copper daggers, but they seem to have a much wider geographical distribution than copper blades and awls (Fig. 6.32). They have all been found in burials and are probably all relatively late in the Predynastic period (Fig. 6.33). However, comparatively speaking, the pattern of the daggers is strikingly similar to the EB I in the southern Levant.

Miscellaneous: this category comprises a wide range of different copper objects, such as a bead, nugget, ear-scoop, lump, tweezers, harpoon, hook, bowl, pendant, dish, ring, chain, armlets, bangle, strip, cone, toilette tool, rod, wire, finger ring, horn and various types of small pieces and fragments (Fig. 6.34). Most of these miscellaneous copper objects have been found in grave contexts, except some small pieces of copper from Bêt Khallàf, one copper nugget from the Badari Village (Spur 3), two lumps of copper from Badari (area 3200) and the copper fishhook from Kom el-Ahmer, which are all found in a settlement context. The variation and the quantity may be the most important aspect of the miscellaneous objects. As indicated by Baumgartel (1960:19), about half a dozen harpoons have been recovered

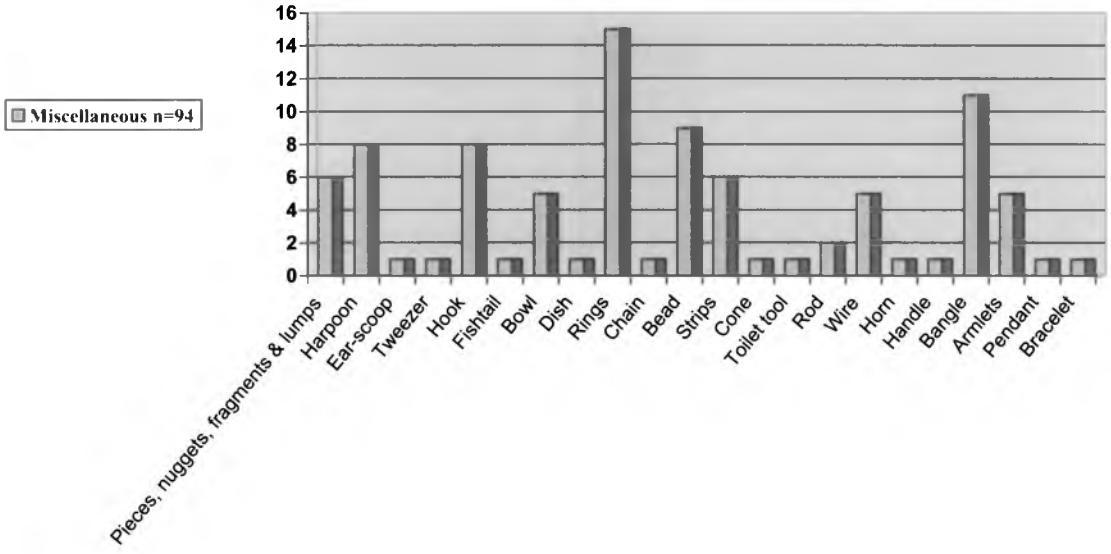


Figure 6.34 Miscellaneous copper objects from the Naqada II period.

from Naqada II, all having a single barb as shown on several pieces of pottery paintings. In addition, there are several ('fish') hooks, and Baumgartel questions whether this is a hunting tool at all. Copper fishhooks are very rare according to Baumgartel (1960:19) and they may not belong to the Predynastic period at all. The use of copper was not only restricted to tools and weapons, but also to personal ornaments or for strengthening or embellishing furniture (Baumgartel 1960:20). Of the personal ornaments, finger rings and beads seem to be the most common. Baumgartel (1960:21) argues that the baboon figurine found at Tarkhan represents the invention of the *cire-perdue* technique by the Naqada II metalworker. Another statuette was found at Naqada t. 721, SD 44–64, made with a wooden core covered with hammered silver.

Here, the category of rings consists of objects described as armlets, finger rings, bangles, bracelets and rings. The most dominant group, though not homogeneous, is the group of

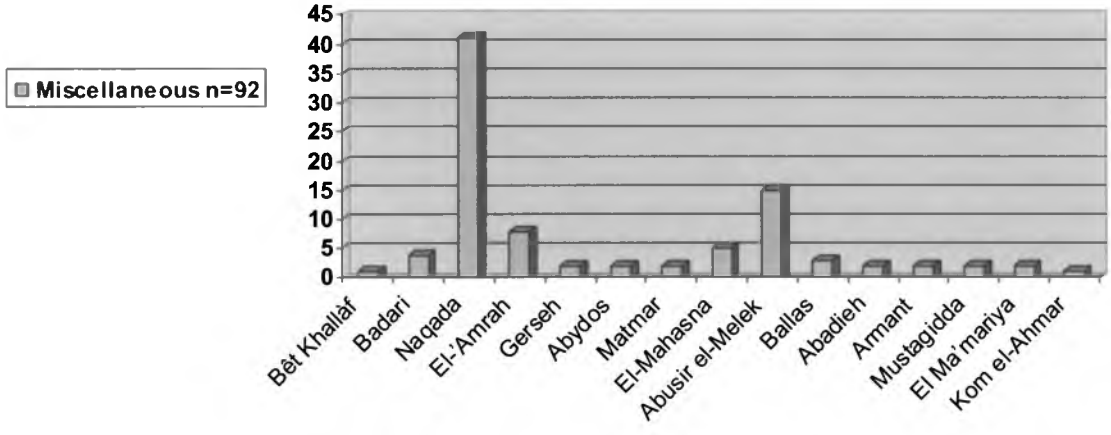


Figure 6.35 Sites with miscellaneous copper artefacts from the Naqada II period.

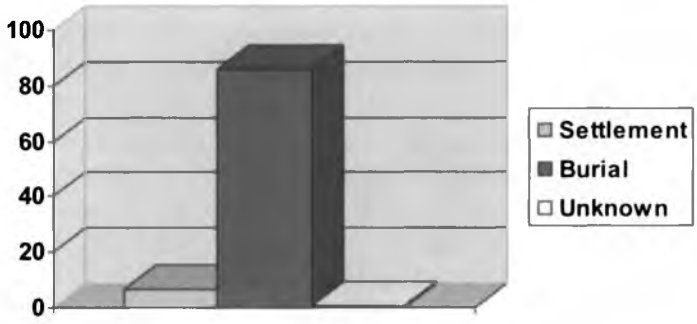


Figure 6.36 The context of miscellaneous copper artefacts from the Naqada II period.

copper rings. Except for this, there are relatively few groups that have five or more artefacts. These include fragments, harpoons, hooks, beads, strips and wire.

Geographically, the general tendency of distribution of copper artefacts seems to be a great accumulation at Naqada, while there are only smaller amounts of copper found at other sites (Fig. 6.35). However, it is striking that there is generally a greater distribution than in earlier reliefs.

The contexts seem to emphasize the deposit of copper artefacts in burials (Fig. 6.36).

With Naqada II, the picture of the copper artefacts changes totally compared to the preceding periods, not only in quantity but also in geographic distribution. It is, however, interesting to note that the accumulation appears to be within regions that later develop into major centres. Further, the variation in types is much greater than compared with the Levant, though there is a clear emphasis on burial contexts.

Lower Egypt (the Cairo Region, Maadi, Eastern Delta and Buto)

The only copper objects known from Lower Egypt are found at the site of Maadi, Buto and Minshat Abu Omar, all located in the Delta region. However, this does not necessarily imply copper smelting or casting. At Maadi, there are no traces of gold or silver (Rizkana and Seeher 1989:13), although this is known from other sites in Egypt as well as in the southern Levant. 'The neolithic settlers at Maadi knew copper very well, and apparently possessed large quantities of it. In many places distinct grains of some green oxide, evidently remains of decayed copper implements, were met with. Numerous pieces of wire-like copper, some of them certainly fragments of pins, were found in Sebabkh-holes' (Menghin and Amer 1936:48). Rizkana and Seeher (1989:13) also note that copper artefacts and ore were found in all areas and layers excavated, although some of the artefacts were in a very poor condition. It is also interesting to note that none of the 547 graves at the two cemeteries in Maadi and the nearby cemetery at Wadi Digla have yielded any copper artefacts although copper ore was found in some of the graves (Rizkana and Seeher 1989:13).

At the Heliopolis cemetery, 10-15 km north of Maadi, there were no copper artefacts in the graves and no settlement has been located in relation to this cemetery. The Predynastic cemetery is more or less contemporary with the Maadi settlement and the vessel types are similar only with a few exceptions (Debono and Mortensen 1988:34). In the graves at Heliopolis, there were also palettes recovered, usually flat flint nodules. One had ochre adhering and another, malachite. Malachite was also found in graves at the Wadi Digla cemetery close to Maadi.

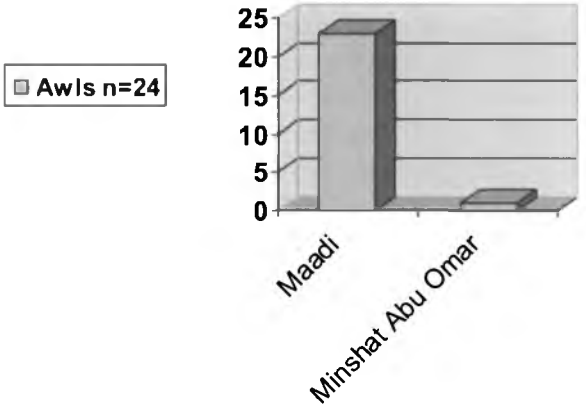


Figure 6.37 Sites with copper awls from Lower Egypt.

Awls: The picture from Lower Egypt is relatively clear regarding both copper awls and blade tools. From Maadi, all the awls are from a settlement context, while the needle from Minshat Abu Omar is from a grave context (Fig. 6.37).

Blade tools: Only recovered at Maadi, the blade tools are all from a settlement context.

Miscellaneous: Of the 72 miscellaneous copper artefacts recorded, 50 are classified as fragments and all are from Maadi. It is worthwhile noting that seven fishhooks and one harpoon have been found. With the exception of this, the copper artefacts only consist of minor numbers of sheet metal, wire, beads, rod and ingots (Fig. 6.38). The fishhooks and harpoons have clear typological parallels to both both Upper Egypt and the southern Levant.

The majority of the miscellaneous copper artefacts have been discovered in settlement contexts (Fig. 6.40). Most of these come from Maadi, a few from Mishat Abu Omar and one is from Buto to the west in the Nile Delta (Fig. 6.39).

What seems clear is that the types and contexts of copper artefacts in Lower Egypt do have more similarities to the southern Levant, than to Middle and Upper Egypt. This may be

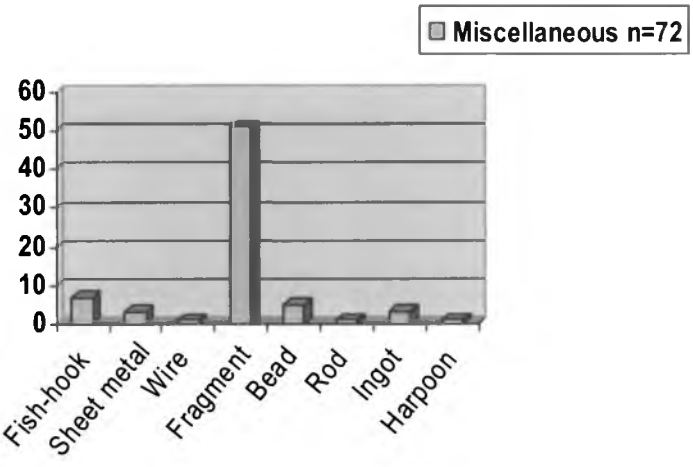


Figure 6.38 Miscellaneous copper artefacts from Lower Egypt.

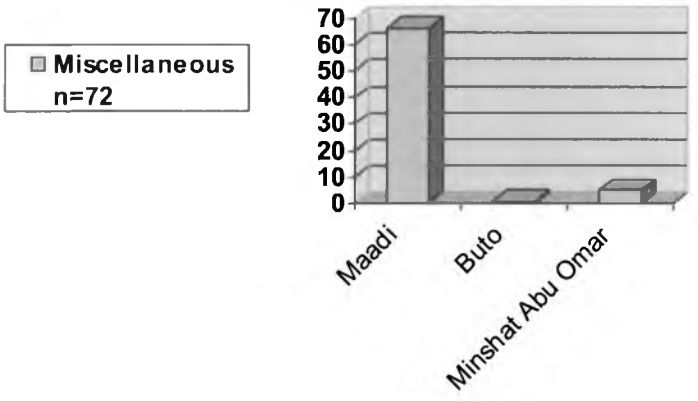


Figure 6.39 Sites with miscellaneous copper artefacts from Lower Egypt.

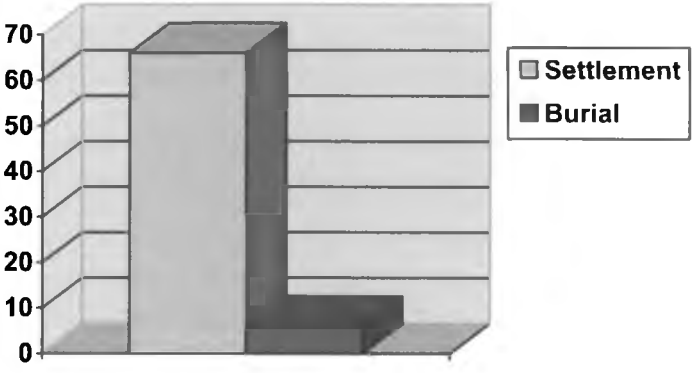


Figure 6.40 The context of miscellaneous copper artefacts from Lower Egypt.

connected to different adaptation strategies, as discussed in the preceding chapter on pastoral nomadism.

In Egypt, the inventory of copper artefacts is more or less the same, though the quantity of the copper is different. From Naqada I and onwards, there is a gradual development of the repertoire. Copper artefacts were no longer limited to small objects and gold and silver appear. There seems to be development of a class of artisans who were specialized and attached to the elite. Certain goods and symbols, such as copper and mace-heads, became important signs of status in the process of accumulating wealth (Bard 2000:61). During these cultural phases, there is no evidence of mining, smelting, or casting of copper in Upper Egypt, except from Maadi in Lower Egypt. Here copper ore has been found. Appearing during the second half of Naqada I Maadi continued until Naqada IIc/d (Midant-Reynes 2000a:57). It seems to have been involved in intercultural contact and exchange, having many similarities with the southern Levant. Copper may have played a significant role here (Midant-Reynes 2000a:58–9). Trace analysis indicates that ore from Feinan in Jordan was used at Maadi in Lower Egypt (Hauptmann 1989:131) and further supports connections with the southern Levant.

Lower Nubia—the Nubian A-Group

In 1910, Reisner (1910:233) suggested that the working of copper by the Nubian A-Group was far more advanced than that of Predynastic Egypt. This is rather doubtful in view of what we know today, but the relative 'richness' of copper artefacts in the Nubian A-Group is striking. As in Predynastic Egypt, copper implements and artefacts were also found in graves of higher status in Lower Nubia. Generally, chisels, adzes and axe blades were recorded in male burials, while knife blades and awls were found in female burials, although there is no strict rule on this. Nordström (2002:363) has suggested that the copper items of Predynastic Egypt were made in Egypt and exported to Nubia. Nevertheless, he does not rule out the possibility that some of the more frequently occurring implements, like the needles and awls, were manufactured in Nubia, even if the metal itself was imported from the north.

Awls: Copper awls have no eyes like needles and usually have a slightly rectangular or square section (Nordström 2002:363). They are also identified as bronze borer or bronze stylus. Piercers, sticks, etc. are included in this category as well. An interesting feature of awls is that some of them still have handles made of sheep or goat bone attached, which indeed indicates an indirect pastoral connection, although Nordström (2002:364) does not rule out the possibility that leather may also have been used for the grip. The awls have generally been part of the funerary equipment (cf. Nordström 2002), while they have also been found in habitation sites (Fig. 6.42). All the burials are considered adult or possibly adult. According to Nordström (2002:364), none of the graves with copper awls are dated to the earliest period of the A-Group, being dated only to the end of the Middle A-Group and to the Terminal A-Group.

Although there may be some uncertainty regarding context, 67 awls have been recorded and all are incorporated here (Fig. 6.41). As indicated by Nordström (2002:364), in total 41 acceptably dated awls in a good contextual condition were found in 34 graves. In addition, several have been found in uncertain context, though it is probable that they belong to the A-Group. Of the former 41 awls, there are five burials having two awls recovered and

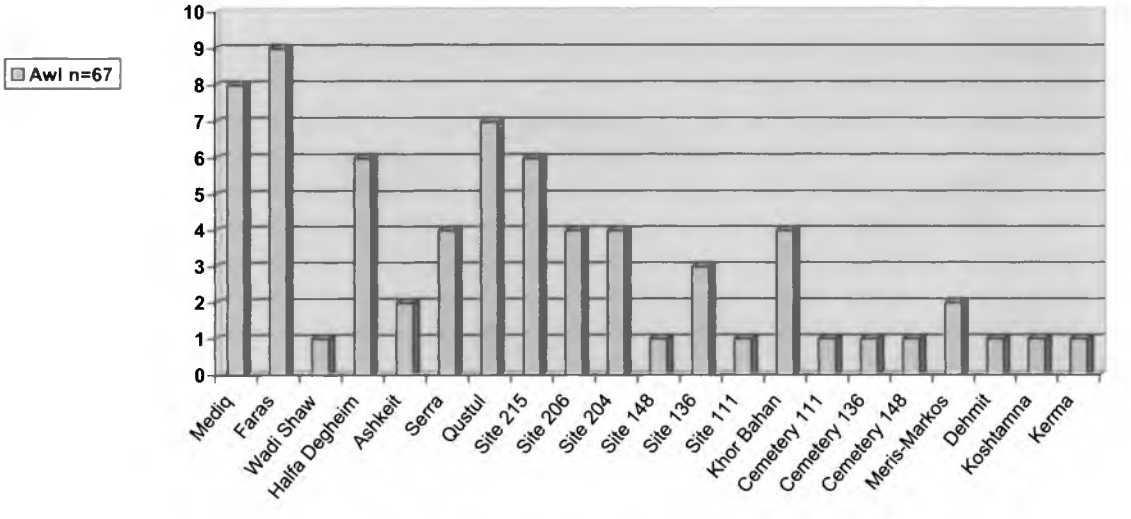


Figure 6.41 Sites with copper awls from the Nubian A-Group.

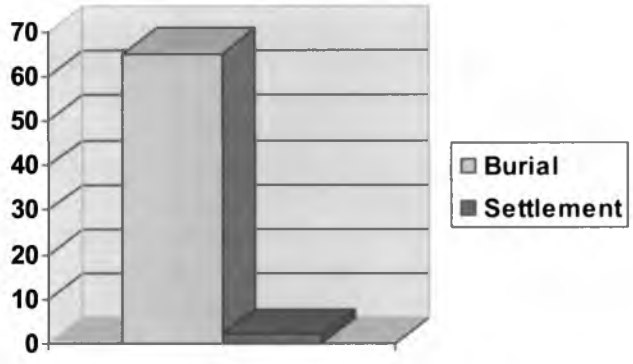


Figure 6.42 The context of copper awls from the Nubian A-Group.

one uncertain case with three awls, although the regular deposition is one awl per grave. However, Nordström (2002:364) also notes that there are a few awls from excavations that have not yet been fully published, such as Aksha and Faras W. It is noteworthy that the copper awls are relatively common and are represented at a number of cemeteries. Sites like Mediq, Faras, Halfa Degheim, Qustul and site 215 seem to have more copper awls than other sites. In addition, Honegger (1999:81) has found a copper awl together with a quartzite palette in a woman's grave in the Pre-Kerma section of the great cemetery at Kerma, dated to *ca.* 3000 BC and possibly related to the A-Group. This is the southernmost copper find known in the region, but also when considering Africa in general (see Chapter 8). Moreover, a few copper awls are known from habitation sites, for example from Saras West in the Nile Valley (Mills and Nordström 1966:6) and Wadi Shaw in the desert to the west of Nubia (Lange 2000).

Several researchers have noted that the awl seems to have been of particular importance in the Nubian A-Group and Griffith (1921:10) notes the particular deposition at Faras. 'The piercers were generally found in front of and close to the face, chin or neck, where the hands were placed, and might be taken for kohl-sticks or the like' (Griffith 1921:10).

As Nordström has noted more recently (2002) the combination of awls and stone palettes, often having a green malachite stain, is a recurrent feature in the adult female burials of the A-Group in Lower Nubia—the awls and palettes were almost always found in front of the head or at the hands of the dead.

This data may indicate that the awls have been used for body decoration. They have also been found in Predynastic and Early Dynastic Egypt, but here the interpretations are generally connected to carpentry and leatherwork (Emery 1961:221). Most of the copper awls were found in rich burials with numerous finds and diversified equipment, but there were also copper awls associated with burials of low ranking (Nordström 2002). No awls are found further north than Dakka in Lower Nubia, with the highest concentration of awls recovered between the Second Cataract and Toshka Reach. Nordström (2002:365–6) therefore suggests that the northern part of the Lower Nubia is a 'grey zone' in the Terminal period of the A-Group.

Blade tools: The blade tools include chisels, axes, celts, adzes, knife blades and spearheads. Griffith (1921:9–10) notes that flat chisels and axe heads occurred in several graves. Griffith (1921:11) further notes that the larger copper tools, celts and chisels found at Faras were

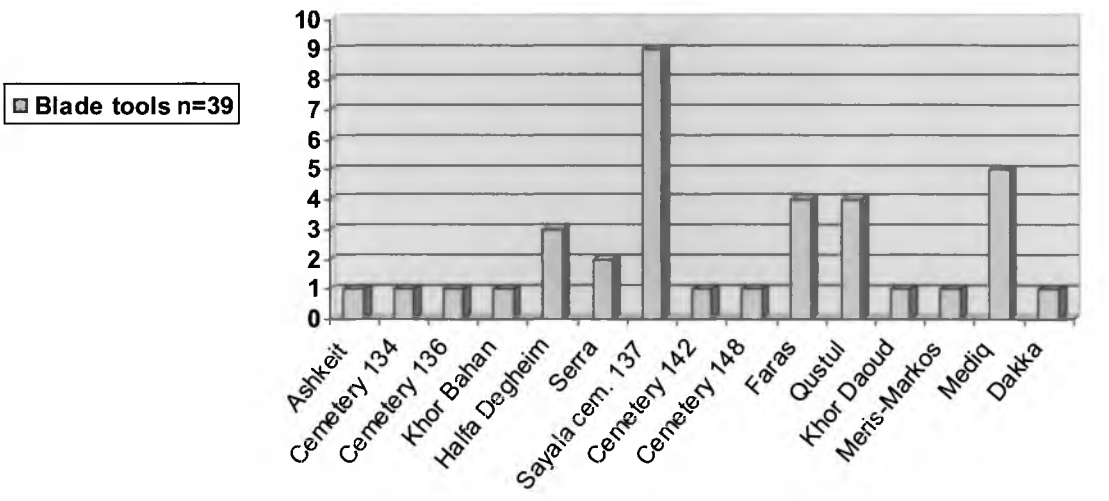


Figure 6.43 Sites with blade objects from the Nubian A-Group.

confined to the larger, more important graves, though not above what could be defined as small, poor graves of the same period in Egypt.

In line with Nordström (1972:123), knife blades are very rare in the Nubian A-Group (Fig. 6.43). Petrie (1917:22) described this type of knife as a 'flaying knife' occurring as early as S.D. 49.

Adzes similar to the ones found by the Scandinavian Joint Expedition have also been recovered in several other Nubian A-Group cemeteries (Hofmann 1967:106 with references). Petrie (1917:16) argues that the adzes with the straight butt, type Z60-65, occur from the Predynastic period to the beginning of the First Dynasty, while the adzes with the rounded butt, type Z 69-75, began in the Early Dynastic period. The plain axe blade type corresponds to Type A and A104 in Petrie's classification (1917) and in Egypt they are found in contexts dated to the late phase of the Predynastic period (Naqada III) or to the First Dynasty. According to Nordström (1972:124), the axe is relatively uncommon in Nubian A-Group contexts.

The most common types of blade objects appear to be the adze, axe and chisel, while knife blades, spearheads and celts seem to be rare (Fig. 6.44). However, it may be noted that

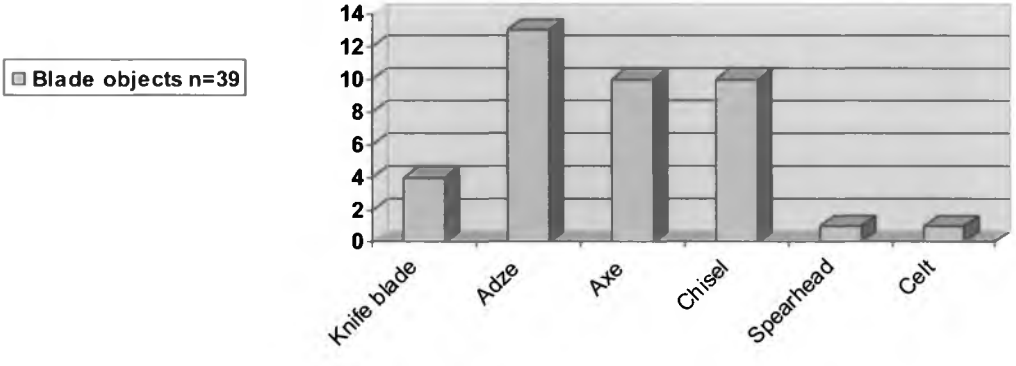


Figure 6.44 Types of blade objects from the Nubian A-Group.

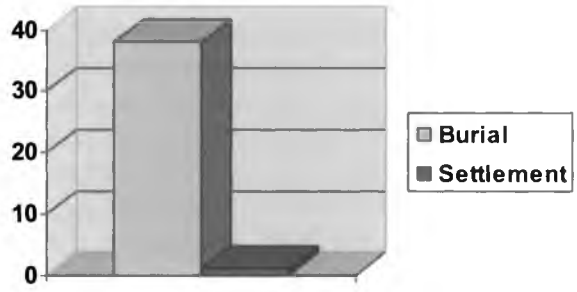


Figure 6.45 The context of blade objects from the Nubian A-Group.

there are minor differences between many of these categories. In addition, the blade objects found at Sayala Cemetery 137, Tomb 1, have been classified as adzes, while the original description is 'adze/chisel'. Similarly, the blade objects found at Cemetery 142, Grave 1, have been classified as axes, while the original description is 'axe/chisel'.

All the blade objects have been found in graves, except the axe found at the Archaic Camp at Meris Markos (Fig. 6.45) (cf. Reisner 1910:216).

Miscellaneous: This category includes beads, finial, tray, a cap for furniture leg, ring, bangle, fishhook, wire, figurine and bracelet (Fig. 6.46).

Types such as harpoons, amulets, or bracelets of copper are not common in the A-Group (Rampersad 1999:234). Several of the miscellaneous objects come from Qustul, in addition to one spearhead and two awls. Bruce Williams (1986) has argued that the people buried in Cemetery L at Qustul might be predecessors of the First Dynasty rulers in Egypt with a common origin in Naqada I and II, although this has been met with scepticism. However, as he points out (Williams 1986:185) with reference to the A-Group, the funerary paraphernalia consisted of mixed ideas and materials from the north (Egypt), the south and west (Sudanese-Saharan) and the east (Pan Grave-Medjay). On the basis of the metal, being in this case copper artefacts, Qustul is not very rich in quantity, but the copper artefacts recovered here are not common types found elsewhere (Williams 1986:128). In addition to the copper, one gold bracelet was found at Cemetery L. Although gold is not frequent in the Nubian A-Group, 46

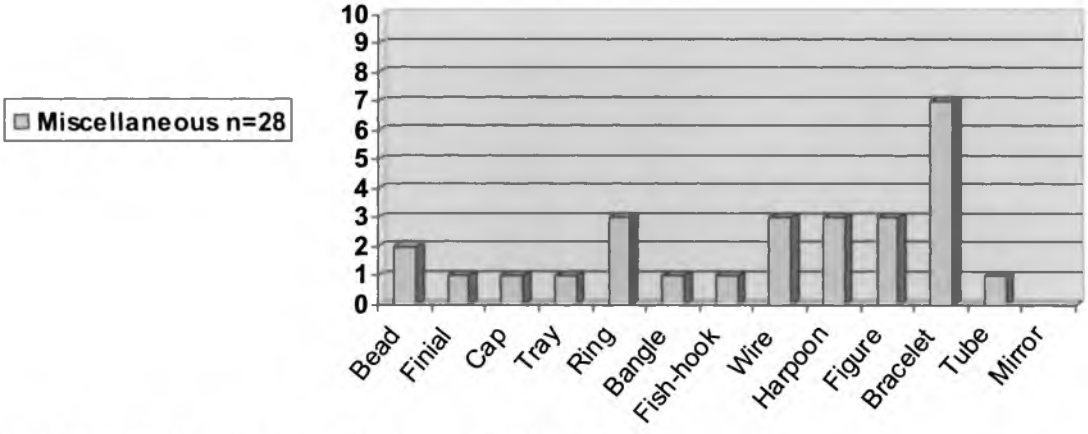


Figure 6.46 Miscellaneous copper artefacts from the Nubian A-Group.

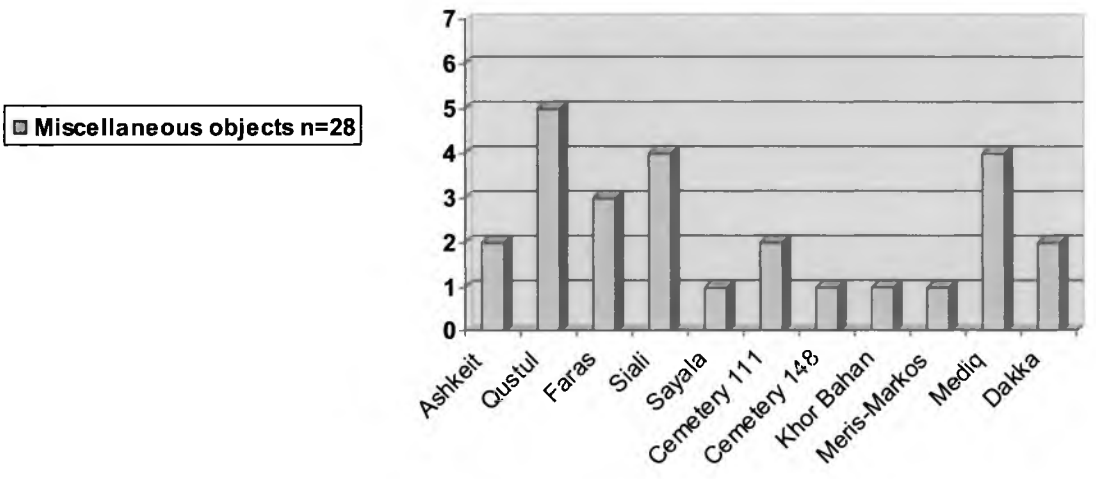


Figure 6.47 Sites with miscellaneous copper objects from the Nubian A-Group.

gold beads have also been found at Halfa Degheim, site 277 (Nordström 1972:125, 202, pl. 195:1).

There does not seem to be much variation in the miscellaneous copper artefacts, though the bracelet of copper is dominating. Comparatively, there is less variation in number and type in this category, compared with Egypt.

The copper artefacts from the Nubian A-Group consist principally of bracelets, small copper beads, axes, adzes, knife blades and awls. The latter is especially 'common', but they are all relatively simple artefacts in technological terms and could have been cast in open moulds or just hammered from native copper. No artefacts are, for example, cast by *cire perdue*. The great majority of the A-Group copper artefacts are part of the funerary equipment, with the exception of some copper awls found on habitation sites (see above Fig. 6.47) and an axe from a poorly published settlement at Meris-Markos, Siali (Reisner's Archaic Camp near Cemetery 41, 1910:215–18). In any case, the general picture is that copper artefacts are deposited in graves and rarely left at sites or other depositional contexts. Copper tools, such as awls, adzes, fishhooks and axe-blades, are found throughout Lower Nubia, at least as far south as Saras in Batn el-Hagar, with the exception of the awls from Wadi Shaw in the Eastern Desert and those from Kerma. However, there is no evidence of copper smelting, gold mining or large-scale quarrying (Nordström 1972:25). There are sources of carbonate copper in Lower Nubia. The smelting industry was not established at Buhen until the Fourth Dynasty, although one cannot rule out the possibility of knowledge of these resources in the Predynastic periods.

One possibility is that these artefacts were made by the A-Group locally in a context where they also collected copper nodules on the surface in the area. As the region is copper bearing, and especially in the Red Sea Hills to the east, there is a slight possibility that this was the case. The lack of any affirmative evidence to support local resources, with the exception of the possibility that the artefacts were made of relatively pure copper, may suggest that the copper was not local (cf. Trigger, Nordström, Williams etc.). In addition, the relative 'poorness' of artefact quantity and quality indicates that the copper came from elsewhere, possibly through Egypt.

These are issues that need to be noted in relation to the find contexts of the copper artefacts. The fact that the majority belongs to funerary contexts is nothing new, but it indicates the importance of copper in relation to the social structure. Some 'camp sites' also have copper artefacts, like Meris Markos and this is significant as it indicates something about the relation between copper and subsistence (pastoral nomadism) and the economic value of copper in these societies.

Some Functional Aspects of Copper Artefacts

Generally, copper artefacts, such as awls, chisels, borers, daggers, etc. are by definition given a functional role. However, as has been discussed earlier, there are no clear-cut divisions between the functional and the symbolic aspects of an artefact. Often, artefacts may be used in both a functional and a symbolic realm, still maintaining the symbolic content and value. In a broad sense, the copper artefacts classified as mace-heads, standards and crowns also have a functional aspect at a larger social level, for example if they are used in rituals, processions and ceremonies.

The blade objects, including chisels, axes and adzes are all of the same shape with differences in size and all lack direct evidence of hafting. The earliest blade objects come from the southern Levant and from a typological point of view, Miron (1992) suggests that the copper blades from Ghassul are the earliest ones. This is based on the fact that there is a large quantity of flint adzes and axes, while relatively few appear in copper. The ones in copper have a similar shape to those in flint and appear to be relatively simple. Blade objects from Beersheba and other sites represent a more mature and advanced metallurgical stage from a typological point of view (Miron 1992:25). The blade objects from the southern Levant, as illustrated by Miron (1992), are all of a simple blade type, which is also the case for Egypt and Lower Nubia. The typological changes seem to occur with the social changes that are witnessed both in Egypt and in the southern Levant. There is greater variation and refinement after *ca.* 3000 BC with crescent, lugged, fenestrated, double, and various other blade objects in the 3rd and 2nd millennia BC.

Miron (1992:22) suggests that the chisel in its classical form is long, narrow and thick with a square or round cross-section, like one from Bir es-Safadi and several of the blades from Nahal Mishmar. He also points out that the distinction between axes and adzes is more problematic, but points to functional differences, as the axe is used for chopping and cutting, while the adze is used to shave layers and levels a surface. Some adzes also have sharpened butts, and it may be questioned if these objects really had a strictly functional purpose at all. Miron (1992:24) has raised the question of whether the axes and adzes of the Chalcolithic and Early Bronze Age were used as battle-axes, but there are no clear indications of this. There is little standardization and scarce evidence of warfare and other weapons, except for a few daggers and spearheads. However, this does not rule out the possibility of battle-axes later in the Bronze Age, but it does not seem to be the case for the periods dealt with here. Functional differences may be extremely small in practice and will not be discussed further here.

Copper bowls or dishes are only known from Egypt and do not have any similarities in either Lower Nubia, or the southern Levant. For the few bowls or dishes found in Predynastic contexts in Egypt, Radwan (1983) has suggested that they may have been used for cosmetic purposes, similar to the palettes in schist and slate. However, it remains unclear if these had any stains of ochre, malachite or another kind of pigment still adhering to the surface. They are

all relatively few and dated late in the Predynastic period. Petrie and Quibell (1896:47) suggest that, as they are both light and pierced for hanging, they may have been used as ornamentation placed on the forehead, as recognized from later Dynastic periods. This interpretation may at least be reasonable for the bowls from El Mahasna T. H 85, Naqada T. 1770 and one from Abusir El-Melek, T. 1094. However, several of the other bowls or dishes may well have been used for cosmetics, as well as for liquids. Lucas (1962:200) suggests that the Egyptians were in possession of practical copper weapons by the end of the Predynastic period. During the first Dynastic period, there is a great increase in the number of copper items, such as axes, knives, daggers, spears, etc., in addition to household utensils.

Yet, the most important issue regarding the blade objects especially, is that many, if not the majority, are not used at all. This is seen in contexts like Nahal Mishmar, Maadi and others, which may question the actual function and meaning of these objects as 'utilitarian'.

Observations of the different sections of the awls from the southern Levant and Predynastic Egypt, suggest that the awls of the Lower Nubian A-Group are slightly later. This may indicate that the copper awls instead had their origin in the southern Levant, diffusing into Egypt with the early forms having a round-section, and only later changing to a square-sectioned awl, possibly during the second half of the 4th millennium. The latter is now found throughout the region of northeast Africa and the southern Levant. Although there are chronological differences between the regions, they all represent the introduction of metal artefacts into a cultural context. The differences are probably also due to different cultural perceptions and values regarding copper.

In total, the repertoire is also very different from Egypt and Nubia, though the Nubian A-Group artefact types are also found in the southern Levant. Basically, the Levant is richer in the number of categories and in amount and refinement. Only a few of the categories are similar (awls, adzes and axes). The square-sectioned awls found in EB I contexts in the southern Levant are also found in the nawamis of Sinai, in Egypt and in the Nubian A-Group of Lower Nubia. It appears to be a common artefact particularly connected to dry and semi-dry environments.

Metallurgical Aspects of the Copper

Before setting aside the metal and metallurgical issues, it is useful to briefly note some issues concerning the composition of the copper artefacts. Over recent years the focus has been on the technical and chemical aspects of metal artefacts because there is a huge potential to gain a greater understanding of the technological processes and of where the ore is derived.

The composition of metal artefacts may be due to various considerations. The most obvious is that the composition stems from the ore used, but smelting, casting and colour properties may also have played a significant role. In addition, the chemical composition may also influence the hardness and malleability of the metal, which is significant for most of the artefacts considered here. The composition may affect the finishing processes, such as polishing and engraving/chiselling.

The Southern Levant

A number of studies of the composition of copper artefacts have been undertaken, especially with the discovery of the hoard of Nahal Mishmar (Key 1980). Some studies were done

earlier in connection with the discoveries and excavation in the Beersheba region, especially at Abu Matar and Bir es-Safadi. It is beyond the frame of this study to review all the work done, but significant work has been undertaken in connection with a number of excavations in the Beersheba region. Hauptmann's work in Feinan in Jordan is also of great importance. Levy's work from Shiqmim and the general interest in the role of metal in these societies has led to a number of compositional analyses. Essentially, the discussion has centred on whether the complex castings are local or imported. Levy, especially, has been a strong opponent of imported complex castings, although there is no evidence of a local production. Hauptmann (2000) has recently published important work on the early metallurgy of copper in Feinan.

A recent reinvestigation of the Nahal Mishmar hoard, focusing on technology, composition and provenance, has revealed some interesting results (Tadmor *et al.* 1995). The division between what was earlier referred to as complex and simple casting (in addition to functional and ceremonial objects) in particular is much more varied and complicated than thought previously. The analysis suggests that the chemical composition of the objects from Nahal Mishmar may be divided into three groups (Tadmor *et al.* 1995:143, 145): those made of antimony-arsenic rich copper, those made of very pure copper and those made of nickel-arsenic copper with very low contents of antimony. These results are, as they suggest, compatible with the assumption that local ores were used as raw material for the unalloyed copper. Technologically, most were cast using the lost-wax method. Tadmor (*et al.* 1995:143–4) points out that the deliberate use of antimony-arsenic rich metals, as well as the casting method, is evidence of professionals with remarkable expertise and they suggest that many of the objects were made by expert smiths.

Regarding the source of the antimony-arsenic rich metal used in several of the artefacts from the hoard, Tadmor *et al.* suggest Anatolia as the best candidate, referring in particular to ore finds from Norsuntepe and Arslantepe, which have similar ratios. The source is unclear and Ergani Maden is an unlikely alternative, but Transcaucasia and Azerbaijan do have similar ore deposits (Tadmor *et al.* 1995:141). Based on the composition of the antimony, arsenic and the Pb-rations, this rules out Feinan, Timna and the rest of the Arabian Peninsula (Tadmor *et al.* 1995:140–1). However, the interesting feature here is that the immediate region of Nahal Mishmar is ruled out and the sources seem to stem to the north. This is also contemporary with the continued slow flow of obsidian (e.g. Tell el-Mafjar and Nahal Tillah, see also Chapter 8) from the regions to the north of the southern Levant, and it may be suggested that the metal from Nahal Mishmar was exchanged and transported along previously established routes.

From EB I, there are also a number of analyses such as Yiftahel, Azor, Wadi Ghazza and other sites. Phillip (2001:214, with references) mentions that the copper artefacts from Yiftahel in Galilee have revealed low-impurity and unalloyed copper traditionally associated with the Chalcolithic and Early Bronze Age tools. A metallurgical analysis of one of the awls from Azor gave the following results: 91.07% Cu, Sb 0.125%, Ag 0.0010%, Ni 0.0046%, Pb and Sn < 0.02%, and IR 6.9% (Ben-Tor 1971:24, n.29). This is relatively impure copper, though it lacks other traceable elements.

From Site H in Wadi Ghazza, mentioned earlier in the culture historical framework, three out of four awls have been analysed, giving copper with 1-1.5% zinc. This is rare, but it might indicate connections with Semiuki in the Eastern Desert of Egypt, known to have copper ore with zinc (Golden 1998:96–7, with reference to Roshwalb 1987). In addition, the site in general clearly has similarities to Buto and Maadi in Lower Egypt (Gophna 1992:392).

Egypt

Very few copper artefacts from Predynastic contexts of Egypt have ever been analysed, excepting the ore from Maadi analysed by Hauptman (1989). However, this is now changing as there is now a larger project being undertaken on the compositional analysis of several of the metal artefacts from Predynastic and early Dynastic contexts. The compositional analyses which have been done are old and not especially trustworthy, though they may give some indications.

An axe was recovered from Matmar, which seems more developed. It is interpreted as a 'carpenters' axe for roughing out pieces of furniture, or the planks of the very coffin under which it was found (Baumgartel 1960:13). Analysis of this axe gave the following results: 97.36% copper, 1.28% nickel, 0.49% arsenic, 0.17% lead, 0.15% iron, 0.6% manganese and 0.5% was not identified. Another later axe, from the tomb of the courtier of King Djer was analysed to consist of 98.3% copper. Petrie suggested it might have been imported due to the lugs of this axe (Baumgartel 1960:14). A similar axe with lugs has also been found at Ezbet el Walda (Helwan). Considering that these analyses may be slightly inaccurate, they show a great pureness of the metal used and it seems doubtful that any intentional alloy was used at all during the Predynastic and early Dynastic periods.

Lucas (1962:483) has produced a table with a compositional analysis of 27 copper objects, from the Predynastic period, well into the Dynastic periods (Fig. 6.48). Only four of these objects are from the Predynastic period and are therefore reproduced here. In addition, one early Dynastic object is also included as it is argued to be Nubian. Although these are old analyses and clearly do not fit with today's standard of analysis, they do give some indications.

For the present, it is difficult to evaluate where the copper in Egypt originates, but as already mentioned, copper ore from Feinan was transported to Maadi (Hauptman 1989). What seems to be significant for Maadi, Nahal Mishmar, etc. is that the metallurgical results point in direction of exchange over large areas and different regions.

Lower Nubia

No analysis has been done of the copper artefacts until now, although Lacovara (2001:295) mentions that A-Group copper objects have been analysed together with Early Dynastic objects, arguing they had a local origin due to the significant amounts of gold and silver, and suggesting the use of native copper.

Therefore, three samples have been taken from A-Group artefacts and analysed by Hauptmann at the Deutsches Bergbau-Museum, Bochum, both with reference to composition analysis and lead isotope analysis. A fundamental basis and assumption of provenance studies assume the composition of the artefacts is related to that of the ores. The composition may give indication if it is an alloy and, together with lead isotope analysis, it could be a useful tool to identify the source. Regarding the isotope, it is the systematic changes in particular, in addition to the isotopic composition of a chemical element, that can be considered to be a characteristic 'fingerprint' of that element (Müller 2005). In this connection, three samples have been taken from an axe (SJE 277/58:1, cf. Nordström 1972), a chisel (292/23:10, cf. Nordström 1972) and an awl (SJE 332/44:2, cf. Nordström 1972), all dated to the Middle and Terminal A-Group by Nordström (all having been mentioned in earlier sections of this chapter). The objects were retrieved from different sites within the Scandinavian accession area, during the Joint Scandinavian expedition to Nubia. The composition analysis gave the results (Fig. 6.49):

No.	Object	Dating context	Copper	Iron	Tin	Lead	Nickel/ cobalt	Arsenic	Antimony	Bismuth	Sulphur	Manganese	N.D	Total
1	Axe	Middle Predynastic	97.4	0.2	Tr.	0.2	1.3	0.5	Tr.	-	-	0.1	0.2	100
2	Bangles	Predynastic	77.6	0.2	-	0.1	0.1	Tr.	-	-	-	-	22.0	100
3	Tool	Protodynastic	98.5	Tr.	-	Tr.	1.2	Pres.	-	Tr.	-	-	0.3	100
4	Dagger	1st Dynasty	99.5	0.1	Nil	Tr.	Nil	0.4	-	Nil	-	-	-	100
6	Chisel	Early Dynastic (Nubian)	93.2	Tr.	Tr.	0.1	-	0.1	-	Nil	-	-	-	100

Figure 6.48 Composition analysis of some Predynastic copper artefacts extracted from Lucas (1962:483).

Sample	*Fe in %*	*Ni in %*	*Cu in %*	*Zn in %*	*Co in %*	*Pb in %*	*As in %*	*Sb in %*	*Bi in %*	*Sn in %*	*P in %*	*Ag in %*	*Sum in %*	*Cu % of sum*
SJE 277/58:1	0,004	0,077	97,8	<0.001	<0.001	0,20	0,88	0,019	0,017	<0.001	0,003	0,039	99,0	98,78
292/23:10	0,005	0,11	99,8	<0.001	<0.001	0,015	0,23	0,085	0,022	<0.001	0,006	0,044	100,3	99,50
SJE 332/44:2	0,008	0,086	93,5	<0.001	<0.001	0,066	0,51	0,24	0,019	0,003	0,065	0,054	94,5	98,94

Figure 6.49 The Nubian A-Group copper artefacts composition analysis.

Pb / *Sample*	*208/206Pb*	*207/206Pb*	*206/204 Pb*	*207/204 Pb*	*208/204 Pb*
SJE 277/58:1	2,150	0,8987	17,21	15,47	37,00
292/23:10	2,086	0,8587	18,10	15,54	37,76
SJE 332/44:2	2,110	0,8765	17,76	15,57	37,46

Figure 6.50 Lead isotope analysis of the Nubian A-Group copper artefacts

The analysis makes it clear that the artefacts are of relatively pure copper. There are, however, very low values of zinc, nickel, silver and gold, which one would expect to find in these artefacts if they were produced locally. One would particularly assume zinc was present because it is known from the Eastern Desert. Furthermore, the small amounts of iron are also known in ores from Feinan and at least point to ore that has been reduced under poor conditions. This does not rule out local resources, but raises the question of whether the copper came via Egypt from elsewhere. However, what seems significant is that they are relatively uniform in composition.

Further the lead isotope analysis has given the results in Figure 6.50 (opposite):

The lead isotope composition of the objects does point in direction of greater variation than the chemical composition. For the SJE 277/58:1 the analysis is according to Hauptmann (pers. com.) from an old copper deposit, possibly the Arabian Shield, as there are no similarities to either Anatolia or Wadi Arabah (Feinan) in Jordan. Though, similar old compositions are known from ores from Saudi Arabia (Hauptmann 2000:60, Abb. 33). Further the other two samples seem to plot in a 'mixing' line between ores from Saudi Arabia and Sinai, as these are clearly different from compositions of the Wadi Arabah. For the time being there is not much comparable material to the lead isotope analysis, but this will be a basis for further investigation and analysis. However, what seems significant is that the copper may both stem from local as well as more distant sources. This opens up for further discussion and analysis, which will not be pursued here.

Copper Beyond Egypt and Nubia

Why did not the people of pre-dynastic Egypt and Nubia not take advantage of these resources at an earlier stage, and why did they not develop mining and smelting of copper as they clearly used copper artefacts? As we will see in a later chapter, metal artefacts are increasingly incorporated into the repertoire of artefacts throughout the 4th millennium BC. There are several possible avenues of enquiry. One is the actual technological know-how, which may not have been present and this theory could be supported by the lack of any metallurgical evidence during these periods. Another is a cultural 'barrier', where at the early stages copper was not regarded as important or of social value. Once the copper artefacts are introduced they seem to gain a relatively high social value. However, further to the south and west this does not have any implications at all, and in fact copper is not introduced to either West Africa or further to the south of Nubia until several millennia later. The Mediterranean of North Africa, the Nile Valley and the Red Sea coast is usually considered to be separate from the metallurgical developments of Sub-Saharan Africa (Miller and van der Merwe 1994:6). In sub-Saharan Africa copper metallurgy appears together with iron metallurgy, without any prior period with copper and bronze manufacture, although there have been some speculations of an early copper age in North Africa there is no substantial evidence before 1000 BC (Miller and van der Merwe 1994:7). Miller and van der Merwe (1994:10) argue that copper and iron smelting was introduced to West Africa simultaneously in the middle of the first century BC from North Africa (see also Holl 2000, who dates the introduction of copper metallurgy a millennium earlier). This will not be explored further here, but it is significant that copper metallurgy develops in other parts of Africa at least

more than two millennia after it was introduced into northeast Africa, and despite the fact that these areas are copper bearing. This may also set an example for the development and diffusion of smelting copper or metallurgy in general, which is not a straight linear event, but is connected to social boundaries and spheres of interaction. This may in fact also serve as a model for the spread of metallurgy to other parts of the world, including Europe, not the iron and copper together but the way it is adopted and introduced. Bisson (2000:84) argues that East African people, and particularly the pastoral groups, placed a much lower value on copper, compared to other areas of Africa where copper was in much more widespread use and it had a ritual, economic and social value (cf. Herbert 1984). It is also worth noting that copper resources are virtually absent in Eastern Africa, which may have been a significant reason why copper and copper metallurgy failed to spread to this region.

Concluding Remarks

In this chapter, a number of important issues connected to the role of copper in the late 5th and 4th millennia of the southern Levant and northeast Africa have been reviewed and discussed. It seems to be relatively clear that the origin of metal and metallurgy in these regions is closely connected to developments further to the north. However, they must be seen as minor and late compared to Anatolia. Although the southern Levant in particular has an early tradition of malachite, this does not seem to trigger the use of metal and metallurgy at an earlier stage. The southern Levant and northeast Africa are both copper-bearing regions, though the area of Feinan in Jordan seems to be one of the earliest within these regions connected to the mining of copper. The case of northeast Africa is much more uncertain, but cannot be ruled out. However, what seems clear is the fact that metal and, in this case, copper and the knowledge of metallurgy seems to appear later in Egypt and Lower Nubia compared to the southern Levant. What is puzzling about the smelting and casting evidence from the southern Levant is that the material is rather scarce, and may possibly reflect a formative period of experimenting, where copper ore was transported over large distances to be smelted and cast far away from the original place of mining. In addition, the composition of the types of metal artefacts as well as the chemical composition has traditionally been regarded to be of local origin. However, there are indications that at least the complex castings are more varied than previously argued, and that they have been imported from Anatolia or adjacent regions. The case of EB I metal and metallurgy is equally puzzling, as the evidence of decline of metallurgy, as well as of the artefacts themselves, possibly implies a different social structure of the earlier metallurgical activities. A number of types disappear, particularly those regarded as complex casting and considered to be 'cultic', although some new types also appear, such as the dagger. It is striking that there is a total lack of evidence of mining, smelting and casting of copper in both Egypt and Lower Nubia, which may support the idea that the copper came from elsewhere during these initial phases, previous to the first Dynasties in Egypt, with Maadi as the only exception being clearly connected to the southern Levant.

There are of course difficulties in comparing material from different periods and regions, particularly when all of them are not fully contemporary. Furthermore, the types themselves are not easy to compare, but the differences are significant. This clearly gives us some indications of the initial phases of adopting metal in societies, how they are appreciated and

given value. As has been emphasized throughout this chapter, the Chalcolithic period of the southern Levant is undoubtedly sophisticated in terms of metal and metallurgical know-how, particularly with the hoard from Nahal Mishmar and a number of specific types that are not known later in prehistory, such as the crowns, sceptre, etc. Comparatively no such types are known either to the north of the southern Levant or in northeast Africa. Mace-heads, though of stone, are known quite early in the northern Levant and in Egypt and Nubia. The copper awls do have a wider distribution both in time and space. During the Chalcolithic period, awls are particularly found at settlement sites and caves, though during the EB I in the southern Levant there seems to be a gradual change towards burials. This is not only reflected in the copper artefacts, but appears to be an overall tendency with greater 'investments' in burials during EB I than during the previous Chalcolithic period, where grave goods are not common nor are there large differences among the graves. One category which is relatively numerous is that of blade objects, which seems to follow the pattern of the awls during the Chalcolithic, with a focus on hoard and settlement contexts. The EB I blade objects also seem to follow the pattern of the awls in EB I; a shift in focus towards burial contexts, although there is a large number of artefacts with an unknown context. The new object of EB I is the dagger. All specimens found in burial contexts, seems to support the idea of increased focus and investments in burials. The artefacts here classified as miscellaneous also seem to follow the pattern of a decline during EB I, as they are more numerous and varied in the Chalcolithic period than the succeeding EB I. However, the length of these periods has also been taken into consideration. Further, the copper artefacts are confined to simple awls, chisels, axes and adzes, and more complex casting disappears. Again in EB II, the picture completely changes to large-scale industrial mining and smelting, both at Timna and at sites in Feinan, which correspond to the rise of urban centres in the southern Levant and fundamental changes in transportation technology.

In Egypt, it is not until the Naqada II period that copper artefacts are really known. During the preceding Badarian and Naqada I, copper is known, but the scale and the artefacts themselves are low and few. However, during the Naqada II, things change dramatically. Not only are copper artefacts now deposited in great quantities in burials than than ever before, but Naqada also clearly develops as a regional centre with great accumulation of copper artefacts. All other sites have only minor numbers of copper and the overall majority of the artefacts are found in burials, indicating that copper is now becoming a medium of expressing power and wealth. One interesting feature is the awl, which still seems to be numerous and important, just as seen in the partly contemporary and slightly later Nubian A-Group. Of the EB I, Naqada II and the Nubian A-Group, there are typological similarities with the squared section of the awl, which seems to be found throughout the regions considered here. The squared sectioned awls found in EB I contexts in the southern Levant are also found in the nawamis of Sinai and seem to be a typological link between the regions. An interesting feature is that EB I and Sinai probably had a great pastoral impact at the time, which probably was the case in the Nubian A-Group as well. In Egypt, both blade tools and the miscellaneous objects seem to be relatively varied, though generally deposited in burials. Very few copper objects have been found on sites in the Nile Valley, though this must also be seen in connection with sites both washed away by floods and buried deep down in the alluvial deposits. With the transition to the first dynasties in Egypt, the copper artefacts change both in quantity and type, now being richer and more varied than ever before, probably indicating

a more direct and secure supply of metal which had not been the case earlier. The Naqada II is characterized by a process of expansion from the nuclear areas in Upper Egypt towards the Delta in the north and the Nubian A-Group in the south. Growing specialization and differentiation in the grave material is seen at sites such as Hierakonpolis, indicating burials of powerful persons by larger accumulations of funerary artefacts and greater exclusivity, including copper. This expansion made it possible to obtain ivory, ebony, incense and skins from the south, and copper, oil, seashells from the north and east. Copper artefacts were no longer limited to small objects and gold and silver appear. During Naqada III, Egypt was unified into a large territorial state and a political consolidation that laid the foundations for Dynastic Egypt. Towards the end of the Predynastic period, burials show an increasing hierarchy with economic interaction and long-distance exchange. Here, the control of exotic raw materials and craftsmanship became important in the towns or centres of Upper Egypt. Certain goods and symbols became important signs of status, such as copper and mace-heads, in the process (Bard 2000:61).

In Lower Nubia, there are even more awls than known in Egypt, which again should emphasize the importance of this artefact. As seen in Egypt, the focus and investment is turned towards burials along the Nile. This is striking, as there is no clear evidence that the copper may have been easily replaced with new artefacts, and it is likely that the supply was extremely limited. Awls are quite common at a number of cemetery sites in Lower Nubia, though major and important areas, such as Merdiq, Faras, Halfa Degheim and Qustul, are reflected by the largest numbers of awls. Only two awls have been found in settlement contexts, however; the one found in Wadi Shaw in the Western Desert clearly emphasizes the pastoral nomadic character of the Nubian A-Group and the importance of awls in these societies. Copper awls seem to be introduced into the ritual sphere, are used for body decoration and deposited in graves. In Lower Nubia, women seem to play a significant role in the ritual order, while in Egypt and the Levant this is not clear. It is well known from ethnographic descriptions that awls are both prized and traded over large distances. However, one issue seems clear; although copper was a scarce commodity, it was during the 4th millennium BC deposited in graves, indicating its symbolic value rather than its 'economic' value. In addition, copper awls were the most common copper artefact of the late 4th millennium BC in both the southern Levant and northeast Africa. Copper and its early use may in fact be an avenue to understand the impact of early metal artefacts and the ritual significance over large areas, where specialized nomads played an important role in the evolution and formation of complex societies. Blade objects are also fairly common in the Nubian A-Group, and here particularly Sayala stands out as an important site. All blade objects are found in grave contexts here. The miscellaneous artefacts are relatively few, except for a few unusual types found at Qustul and Sayala.

The emphasis on connections and interregional contacts are further supported by the metallurgical aspects of copper in the southern Levant, as well as Egypt and Lower Nubia, suggesting that copper was transported and exchanged over large distances, where the arid zones particularly seem to have played an important role. The analysis of the Nubian copper artefacts may provide a basis for greater understanding of these processes in the future.

Now it is necessary to turn back to the greater implications of both copper and the secondary products, and consider if these and other types of artefacts are part of a larger system of specialization, contact and value.

7 Contact, Specialization and Value

After having set the culture historical framework in earlier chapters with an examination of the role of nomads and the progression of early copper in more detail, it is now necessary to take the analysis one step further to consider the implications of these issues. This chapter will therefore tie the information already presented together, starting with the development of relations between pastoral nomads and settled agricultural societies in the regions discussed. Thereafter, a broader depiction of the artefacts being exchanged in the 5th and 4th millennia is discussed with particular emphasis on copper, along with a brief introduction of some other important artefacts, such as gold, obsidian, lapis lazuli, turquoise, carnelian and wool. There will then be a short consideration of whether there is a potential for orchards and the implications of this with reference to interregional exchange. We will also reflect on how Lower Nubia and the southern Levant may have been introduced and engaged in this exchange based on the nature of these societies. The discussion is, then, taken further to consider possible trade routes, before taking into account the wider interregional setting and questioning whether there was a system in formation during the 5th and 4th millennia. Subsequently, there is a discussion about growing specialization and the prominence of ritual, considering in detail the scale and implications of metallurgy and whether there is a growing focus on emphasizing equality through increased complexity. Finally, the social value of copper is taken into consideration with a discussion on the introduction of metal and metallurgy, the total number of artefacts and their contexts and the role of copper in the regions discussed in a cross-cultural perspective with attention given to the potential of power and control related to the introduction of the metal.

Contact and Exchange in the 5th and 4th Millennia

A central theme throughout this thesis is the issue of culture contact and its implications for early exchange. Was there actual culture contact during the 5th and 4th millennia BC? What forms did this possible contact and exchange have?

Pastoral Nomads and Settled Agricultural Societies

During the 5th and 4th millennia BC, wide-ranging technological and social changes took place over large areas. The societies of Egypt and Mesopotamia were in their formative periods and may be viewed as merging centres of gravity. As established, there are good reasons to believe that pastoral nomadic societies operated on the fringes of these formative societies, although the pastoral adaptation varied from region to region. However, it seems that nomadic societies also played a vital role in the further development of these formative states, especially with reference to interaction between these major areas. Pastoral nomadic societies have always existed along with more settled societies and most are seen as having mutual and not necessarily competing strategies. This also gives the settled societies a more dynamic dimension with regard to both contact and exchange, where pastoral nomads served as an informal trading network between different agricultural societies. Through such channels, ideas and impulses spread rapidly to large parts of the Middle East including Egypt. The Sinai Peninsula must have been an important corridor between the two continents of Africa and Asia at all times. In many ways the Sinai, together with the arid regions and deserts, provided a difficult barrier to a settled agricultural mode of living. While pastoral nomads would be best equipped to make a passage through this region, they could also provide a passage for ideas and goods. The exchange would not be on a large scale and would only last until new modes of transportation came about, together with new demands for resources and raw materials.

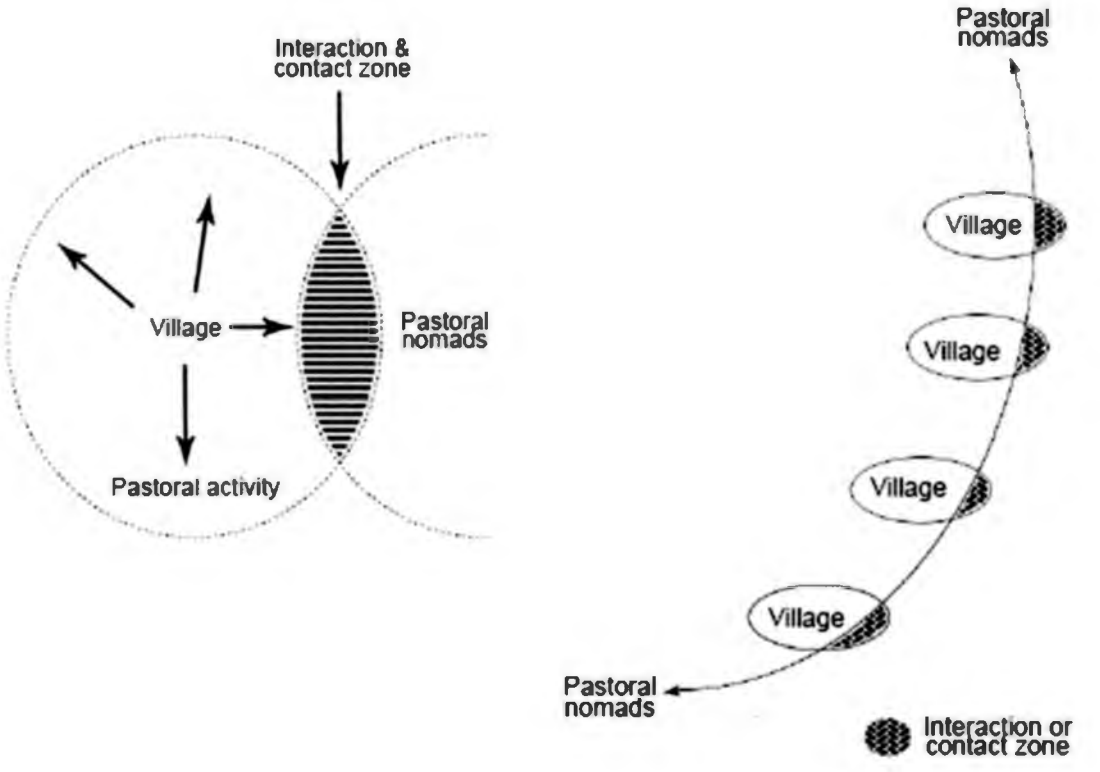
Rosen's (1986:22, fig. 1) map of exchange directions is a useful point of departure, where several items seem to have been brought to the Beersheba region. It is reasonable to assume that the Beersheba region was a centre and items such as flint, basalt and copper were integrated into a large system of exchange where different peoples and subsistence strategies met. We must keep in mind, though, that there must have been certain resources or items that made the Beersheba region important. In addition, its location on the fringe of the Levant, in close proximity to Egypt, also had an impact with regard to means of transportation. There can be no doubt that the secondary products already played a vital role in the region as evidenced by the rich material culture connected to this matter. The settled societies in the Beersheba region could therefore have developed contact with specialized pastoralists in an exchange or barter system whereby the pastoralist lived on the edge of the settled societies, each supplying the other with goods. However, the specialized pastoralists would be the affluent part in this exchange system. They would all be part of the same cultural area, sharing a common core of beliefs and symbols, although they would exemplify different identities: the settled farmer or the pastoral nomad, each representative of different economic adaptations in the region. Most often, there is a focus on the exclusive rather than the inclusive opposition between pastoral nomadism and sedentary agricultural societies. Pastoralism was in any case found in the Late Neolithic societies of the Near East. It is well attested in the material culture of the succeeding Chalcolithic period—with special attention to the secondary products (cf. Sherratt 1981)—which had the social and technological preconditions for this. In the Early Bronze Age external political forces seem to play a major role in altering the pastoral production of the southern Levant and northeast Africa.

There is no discrepancy that the Chalcolithic sites in the Beersheba region have revealed bones of sheep, goats, cattle and pigs, implying a presumed interaction with pastoral nomads. No society is self-sufficient and it is well known that pastoralism and agriculture are often based on mutual existence and exchange. An interesting feature of the metallurgy of the

southern Levant is that it appears in a context of permanently settled villages with a reliance on agriculture and animal husbandry. As mentioned earlier, Gates (1992) suggests that the hoard of Nahal Mishmar must be seen in a context of transhumance pastoralists and a nomadic involvement in the metallurgy and metal trade of the southern Levant. This can be linked to Hauptman's (1990:57) and more recently Tadmor's (*et al.* 1995) argument that the various compositions of different artefacts during the Chalcolithic period indicated extensive trade routes to Anatolia, Mesopotamia and Iran.

Although there is quite a large number of surveyed sites that are confined to the Chalcolithic and EB I period, there is a relatively small number of the sites that have been thoroughly excavated, especially sites reflecting a settled society over a long period of time. All these sites are found in regions where agriculture is suitable or marginally suitable. In the more arid regions, there are some small lithic sites that probably represent a limited range of activities (Rosen 1987:298). With a low artefact density and the recovery of sheep/goat bones, they have been interpreted as examples of a pastoral economy (Genz 1997:444, with references), both on the Jordanian side and in Negev/Sinai (Gilead 1992:33). The small Chalcolithic site mentioned earlier in the Wadi Arabah (Beit-Arieh and Gophna 1976) may be linked to this pastoral activity. Obviously no copper ore or artefacts were found on this site, but several hearths, grinding stones, Chalcolithic flint tools and pottery sherds were discovered. Interpreted as a temporary site, this may well fit into the picture of pastoral nomads existing in the region. This places the pastoral nomads and the settled societies of the southern Levant into a wider interregional system of contact and exchange, often through a longer chain of both formal and informal exchange. This would create interaction, as the ore (or the metal) was transported through different regions and would have involved a negotiation of social relations beyond those directly connected to mining and smelting (Lechtman 1991:46; Knapp 1998:15).

A nomadic (pastoral) system is open. It also had impact on sedentary societies, and played the important role as middlemen in cultural exchange between different sedentary societies. As Khazanov (2001:3) points out, 'Their contribution to transcontinental circulation and transmission of cultural and technological artefacts and innovations, of ideas and concepts, and even of religion is very significant.' This is connected both to the spread of languages and to the role nomads play in political history. A majority of sources shows that nomads were in need of trade items, and sedentary societies benefited most from this trade. In fact the development of the dynasties in Egypt increased the demands for products the Nubian A-Group and other nomadic groups could provide on the fringes of Predynastic Egypt. In the Middle East sedentary societies and nomads were linked to each other for both ecological and historical reasons, and here nomadism was capable of functioning not only outside, but also within the borders of sedentary societies. Various types of nomads specialized in, for example, animal rearing geared towards trade or transportation, or trade alongside their pastoral activity. They were not necessarily long-distance traders, but facilitators of long-distance trade, functioning as 'trade or exchange facilitators'. It is likely that the A-Group was a highly specialized nomadic society which, though a process of sedentarization, ended up becoming sedentary by the Terminal A-Group with evidence from sites such as Afiah (Smith 1962), before disappearing from the archaeological map around 3000 BC. Specialized nomadic pastoralists are, as Khazanov (1994, 2001) argues, dependent on (sedentary) non-pastoralists as their economy is not entirely self-sufficient. Under circumstances of change in the natural



Figures 7.1 and 7.2 Possible modes of contact and exchange between pastoral nomads and settled societies.

environment, nomads represent a flexible and dynamic subsistance pattern, where changes in the natural environment can easily be incorporated into the subsistence pattern. Although there are methodological problems in identifying nomads in archaeology, as pointed out in earlier chapters there is a growing awareness that nomads existed in the deserts of Egypt and Nubia and the southern Levant, including Jordan (e.g. Betts 1991, 1997; Forenbaher 1997), contemporary with the settled Chalcolithic societies. This would not only be the case for the Chalcolithic period, but also for EB I, Egypt and Lower Nubia as discussed. This may point in the direction of a symbiotic exchange system, where pastoral nomads interacted with settled societies as part of their seasonal migration (see Fig. 7.1 and 7.2).

As observed here, it is likely that there was a growing pattern of contact and exchange developing throughout the 5th and 4th millennia, involving to a larger degree than ever before the arid zones where the pastoral nomads played a significant role.

Copper and Other Materials in Exchange

As already indicated, this implies that there may have been an exchange of copper ore along with other goods in demand in the settled societies of the Beersheba region and along the Nile. A striking feature of the earliest known use of copper in Africa (Egypt and Sudan) is that they have no native resources being exploited at that time, and copper metallurgy is much better known in other parts of Africa (south of the Sahara) at a much later stage in history, where copper was incorporated into large trade networks. The earliest copper metallurgy south and west of the Sahara is dated to the late 2nd millennium BC. The reason why Nubia

and Africa further to the south and west were not introduced to copper metallurgy at an early stage (in the 4th millennium) is probably due to social and cultural reasons, and especially due to the fact that pastoral nomads did not price copper in the same way as the sedentary population did. These issues will not be pursued further here, except for to note that both metal and metallurgy appear in other parts of Africa at a much later stage. It is interesting to be aware of Bisson's (2000:84) argument that east African people, pastoral groups in particular, place a much lower value on copper. The role of copper will be returned to in the last section of this chapter.

Predynastic Egypt created an economic surplus based on irrigation, while the southern Levant and Lower Nubia satisfied Egypt's growing need for the expression of wealth. Many of the Predynastic cemeteries in Egypt are apparently located close to the banks of the Nile and to the desert. Dogs and goats were also buried at cemeteries like Heliopolis, possibly indicating the importance of these animals in nomadic or herding societies. Grave goods, such as basalt, malachite and shells from the Red Sea, clearly show a wide range of connections. Debono and Mortensen (1988:51) argue that Heliopolis has traits from both Upper Egypt and areas to the north and northeast (the southern Levant). They suggest that 'This contact was transmitted by semi-nomadic groups that traded objects and were the intermediaries of culture' (Debono and Mortensen 1988:51). What appears to be a Predynastic or Early Dynastic grave near the Red Sea was excavated by Murray and Derry (1923) in the early 1920s, and Trigger (1965:63) has suggested that it may have been either belonging to Egyptian traders or belonging to a local culture, although it is unclear if this grave can be connected to trade. Its location is intriguing but little is known about the Red Sea coast or the desert to the east of the river Nile.

This increased exchange also resulted in an accumulation of wealth in the Nubian A-Group over time and towards the end of the A-Group it seems to be at its very apex (cf. Nordström 1972 and later). This must indicate that either the cultural basis or the immediate contacts in the region must have had a social or economic adaptation, making it possible to exploit trade and exchange to such a degree.

As pointed out on several occasions, copper and especially the complex casting from Nahal Mishmar and other sites have been regarded as a local feature of the Chalcolithic societies of the southern Levant, although archeometallurgical analysis and the archaeological material itself suggests something different. It is striking that obsidian was definitely transported over large distances during the Late Neolithic and Chalcolithic, while several researchers find it difficult to consider that copper artefacts did the same. An ethnographic example of this is the mining, smelting and casting of copper in Nepal (Anfinset 1996). Here copper was mined and smelted at one place in Western Nepal and then transported several hundred kilometres to Kathmandu to be cast by occupational specialists. Although the trade routes are now broken down by economic and social changes, it gives a fairly good illustration of the long-distance connections across ethnic and religious groups. This could also serve as an example for complex casting being performed away from the mining and smelting area. However, as for the complex casting of the southern Levant, it is likely that copper was also cast away from the mining and smelting areas by specialists, though not in the southern Levant, as there is no evidence of this in the archaeological material. In addition, the geographic concentration of copper artefacts and copper production clearly illustrates the strategic location with access to overland trade routes. Other evidence that may support the idea that 'prestige' or complex casting came from

an area outside the southern Levant is that this type of artefact is not rare in number compared to 'utilitarian' objects, and this may come with the maintenance of long-distance exchange networks (cf. Hosler 1995). Pastoral groups moving over large distances would be extremely suited to acquiring raw material such as copper ore. They would know where to look and be familiar with the countryside much better than the sedentary population. Philip and Rehren (1996) have suggested that the trade routes for copper objects passed through the Wadi Arabah from Feinan south of the Dead Sea and into the Negev. The question that arises from this is what kind of demands made this kind of route important? This may explain why there is a relatively huge accumulation of copper artefacts in the southern part of the southern Levant, while north of the Dead Sea, including Jericho and Teleilat Ghassul, there are relatively few finds. The lack of evidence of copper and copper metallurgy at Teleilat Ghassul is striking, in spite of its proximity to Feinan and its strategic position. Egypt may, in a way, be seen as a cultural filter, possibly explaining why there are so few copper artefacts in Lower Nubia and in in the Southern Levant (see Fig. 7.3).

In addition, it is probable that neither the A-Group population nor the nomads of the southern Levant treasured the copper artefacts as much as the inhabitants in Predynastic Egypt and the agriculturalists in the southern Levant. This was perhaps due to their cultural background and their subsistence pattern, which in essence did not focus on the accumulation of wealth (although this fact changed throughout the 4th millennium towards more sophisticated burials). Copper was only one of several new types of raw materials being introduced during the 5th and 4th millennia BC, besides gold, obsidian, turquoise, lapis lazuli, carnelian and wool to mention a few. These, along with agricultural and pastoral products, were slowly being integrated into a larger system which did not develop fully until the very late 4th millennium.

One intriguing find is that of the eight gold rings at the foot of the Central Hills of the southern Levant in a karstic cave. This is the earliest documented case of gold in the southern Levant, being dated to the Chalcolithic period and interpreted as a cave burial (Gopher *et al.* 1990). In addition to the gold rings, pottery, haematite mace-heads, a large decorated turquoise bead, copper strings bound together, an ivory point and decorated basalt bowls were also found. Here, too, were disarticulated human bones and the skull of a child together with ossuary fragments (Gopher *et al.* 1990:437). It is significant that there was a number of other non-local materials, such as turquoise, ivory and copper, found in the cave besides the gold. As there are no gold resources in the southern Levant, it may well

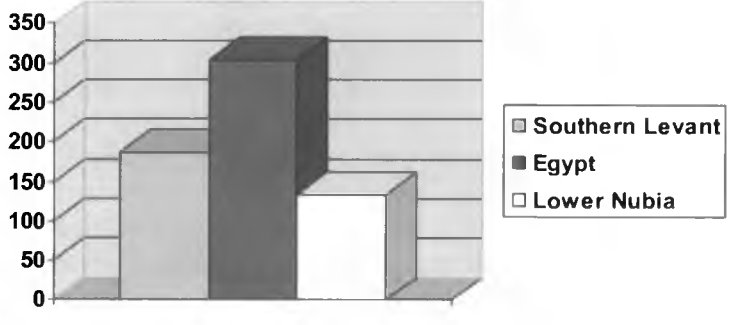


Figure 7.3 The total number of copper artefacts, excluding Nahal Mishmar.

have come from northeast Africa, which Gopher (*et al.* 1990:441) regards as most likely on the basis of similarly shaped rings. Gold is known in both the 5th and 4th millennia in various regions in Egypt from Naqada II and onwards. In the attempt to develop a picture of interregional contacts and exchange already in the late 5th and 4th millennia, this hoard may well be construed as an integrated part of this system a possible exchange for consumable and perishable resources the southern Levant provided in return.

Several sources of obsidian are known throughout the Old World, such as in Anatolia, on the Aegean islands, in Ethiopia and on the Arabian Peninsula (Zarins 1990, 1996). There are two main resources in Anatolia, the Lake Van region and Ciftlik, both in central Anatolia. Exchange of obsidian had taken place for millennia and obsidian from Anatolia is known in the Levant from the Pre-Pottery Neolithic, the Neolithic periods and into the Chalcolithic periods (cf. Mellaart 1975:40–1, fig.11). Obsidian always seems to occur in small amounts at several sites in the southern Levant throughout the early PPN and at least into the EBA (cf. Perlman and Yellin 1980; Bar-Yosef 1981; Aharoni 1982). One example is at Tell Jenin, where only three out of 24,000 lithic artefacts were obsidian in the late PPN layers (Sayej 1997:30). Sayej (1997:31) suggests that this is part of an exchange system that had its roots in the Epi-Paleolithic. Analysis has shown that the obsidian found in the southern Levant comes from central and eastern Anatolia. During the Late Neolithic and Chalcolithic periods obsidian continued to reach the Levant in small quantities. Four pieces of obsidian from Byblos have been analysed. Results show that three came from the sources near Lake Van and one from Ciftlik (Renfrew *et al.* 1966:table 1). Three pieces from Hazorea have been analysed, showing two deriving from Lake Van and one from Ciftlik (Wright and Gordus 1969:81). According to Elliot (1978:44–5), the obsidian bladelet from Ghassul indicates a Lake Van source, because obsidian at Byblos Néolithique Moyen originates at Ararat and Supan on Lake Van and is associated with Halaf trade. Interestingly enough, Elliot (1978:45) also mentions an obsidian core from a Wadi Rabah site at Kabri, probably also from the Lake Van region. From the lowest levels at Megiddo (Stratum XX dated to the Chalcolithic) there is also evidence of flakes and possibly a javelin head of obsidian (Crawfoot 1948:141; Loud 1948:179–80) without any further significance given. This, together with the obsidian found at Tell el-Mafjar and other sites mentioned in Chapter 4, may in fact point to still existing indirect contacts with Anatolia.

Obsidian in Egypt is found in several rich graves of the Predynastic periods and was probably connected to the increased ranking and social status of certain individuals. Small beads of obsidian have been found in Naqada II burials. At Naqada, a retouched blade was pierced and was probably used as a pendant (Petrie 1920:43, pl. XLV/46). Midant-Reynes (2000a:236) suggests that obsidian had to compete with copper as a luxury item and that Egyptians got their obsidian from Anatolia, rather than Ethiopia. It is doubtful if obsidian did compete with copper as a luxury item, though they may both have been important ritual items as the obsidian blades and flakes are often retouched. Needler (1984:275, with reference to Lucas and Harris) also suggests Ethiopia as probable source. Obsidian is also infrequently found in Nubian graves dated to the late Predynastic or Early Dynastic period (e.g. Firth 1927:192).

Although diminishing in amount, obsidian was circulating both in the southern Levant and northeast Africa. It is possible that the obsidian of the Levant, as it did earlier, came from Anatolia (Yellin *et al.* 1996) while Egypt may have been supplied from the south (cf. Zarins 1996). However, analysis of obsidian from el-Tell el-Iswid in the Nile Delta indicates

Nemrut Dag in Anatolia as its source (Smith 1992a:34). Yet, as Zarins (1996:100) argues, 'the obsidian trade can be seen as merely a small part of a much larger trade pattern involving East Africa, Arabia and the Indian subcontinent' including also a number of other highly desirable, both perishable and imperishable items. Already in the late 5th millennium BC, Egypt started to take part in these long distance networks which were vital for the emerging centres, particularly in Upper Egypt.

Lapis lazuli is another raw material considered to be of great value as it was not native to Egypt and its appearance corresponds to the Predynastic burials and intensified trade relations (Bavay 1997). Needler (1984:308) has argued that beads of semi-precious stones, such as lapis lazuli, turquoise and others, are generally not dated earlier than Naqada II in Egypt. Hermann (1968) and Payne (1968) have both supported a synchronous fluctuation in the quantity of lapis lazuli objects from various sites in Mesopotamia, Susiana and Egypt, although several (Needler 1984:311; Lucas 1962:399) do not rule out the possibility of a local source close to the Nile Valley, due to its abundant use at an early stage. However, for now, present-day Afghanistan seems to be the most likely source of lapis lazuli. What is striking is that lapis seems to occur more often in Mesopotamia and Egypt, than in Lower Nubia and the southern Levant. In the southern Levant, a bead of lapis lazuli was found in the Nahal Mishmar treasure, but the context and dating is uncertain, as are the Roman sherds that were also found (Bar-Adon 1980). Mark (1997:122) suggests that the appearance of lapis lazuli in the southern Levant and Egypt coincides with the appearance of gold in the northern Levant at sites like Tepe Gawra, and that lapis lazuli was traded to Egypt through the southern Levant. Lapis lazuli is at least known in Predynastic Egypt from Naqada II and onwards and seems to have been part of informal contacts, which develop into direct contacts and trade routes. According to Mark (1997:39), lapis lazuli becomes especially important during the late Naqada II in Egypt. From the Predynastic period a carved bone figurine has inlaid eyes of lapis lazuli (Lucas 1962:99). Used from Predynastic times and onwards as beads, amulets, scarabs, etc. (Lucas 1962:399), according to Roaf (1999:1), lapis lazuli had divine power in the early Mesopotamian Dynasties.

As turquoise has been found at Tell el-Mafjar, there must have been certain contacts with the Sinai Peninsula relatively early. At Jericho in a PPNB context, a matrix of turquoise from Sinai has been found and there are PPNB sites in the Sinai which could have been engaged in such a network (Mellaart 1975:65). Sites with turquoise are also known in the northern Levant and Zargos, possibly deriving from northeast Iran. Turquoise is rare in the prehistory of the southern Levant, but is found in the PN at Jericho (de Vaux 1966:9) and at the PN settlement at Nizzarim (Yeivin and Olami 1977). Only one turquoise ornament is known from the Chalcolithic: a pendant from Abu Matar (Perrot 1955:171–2) and now the finds from Tell el-Majar, as already mentioned. In Egypt, on the other hand, turquoise is known throughout the Neolithic contexts at Fayum (cf. Caton-Thompson and Gardner 1934: 53, 56, 90) and the Predynastic period (Petrie 1920:44; Brunton and Caton-Thompson 1928: 27, 41, 56; Brunton 1937: 71, 86, pl. 34:12; Baumgartel 1970). However, turquoise is relatively rare in both the Neolithic and Predynastic periods (Needler 1984:308). It is less known in the Nubian A-Group or the other archaeological contexts of the Sudan in the 5th and 4th millennia BC. In Sinai, the main sources are found at Wadi Magharah and Serabit el-Khadim, and these are most likely the sources for the artefacts from both the southern Levant and Egypt.

Carnelian is another raw material which has clearly been transported to sites like Tell el-Mafjar. Carnelian is not uncommon in the Predynastic, as for example, at the El 'Adaima and El Ma'mariya cemeteries, where both beads of different type and shape as well as pendants of carnelian have been found. Carnelian was used in Predynastic times as beads and amulets and Lucas (1962:391) suggests both the eastern and western deserts of Egypt as sources in the form of pebbles.

As seen throughout the preceding chapters, perishable products such as wool have probably also played a significant and growing importance through the 5th and 4th millennia BC, as seen from the material from Tell el-Mafjar. From the current evidence wool seems to be produced earlier in Anatolia (cf. Keith 1998) and the southern Levant, probably due to local adaptation and the specialized use of animals which develops in these regions rather than in northeast Africa. The production and use of wool in northeast Africa is, as argued earlier, a later phenomenon, probably also connected to the use of other secondary products in the region. McCorriston (1997) argues that what he calls 'the fibre revolution' was a shift from the use of flax to the use of wool, which must be seen in a context of relatively self-sufficient communities being gradually integrated into a larger setting of rural and urban settlements and a development of political economies. What is significant here is that this has implications on a larger interregional level, as argued throughout these chapters with the material presented here, as well as on the social and economic level, connected to the formation of new gender roles, to changes in the agro-pastoral production and to changes in social relationships.

Another indication of contact is the presence of seashells from the Mediterranean and Red Seas (cf. Reese *et al.* 1986). As revealed in Chapter 4, Mediterranean and Red Sea shells were found at Tell el-Mafjar. Similarly, shells of Nilotic origin have been found at Ghassul. These Nilotic shells, in addition to Egyptian alabaster and ivory which may have Egyptian origin (Scham 1999:113, with references), clearly indicate interregional contacts. However, as mentioned earlier Scham (1999) focuses on an 'internal development' of Ghassul rather than the consideration of Ghassul as a 'port' or 'cross road', although the location of the site and archaeological material clearly illustrates broad long-distance contacts. The exchange of raw materials as well as finished objects between Predynastic Egypt and sites in the southern Levant, possibly as far north as Byblos, has been suggested by several (Elliot 1978; Marfoe 1987; Levy 1992).

What appears clear is that a number of different raw materials and objects regarded as valuable and used in social strategies were increasingly 'on the move' during the 5th and 4th millennia BC, pointing to a small but important informal exchange network gradually developing towards the late 4th millennium BC.

Orchards and Agricultural Products

In a recent article Fall (*et al.* 2002) argues that there is an increasing intensification of agricultural products during the Early Bronze Age and onwards. This mainly involved rigorous orchard cultivation of olives, grapes and figs with a gradual adaptation to market economies which triggered widespread deforestation. In this way Sherratt's concept is expanded by also including the ecological and social effects of orchard crops. This gradual adaptation had its roots in the Chalcolithic period, where domesticated olives, grapes and figs are found for the first time. It is first in the Early Bronze Age and the later periods, however, that these

practices fully develop. Although Fall *et al.* use sites that are dated to the Early Bronze Age and onwards where the intensification and decline in orchard horticulture correlates with political developments as the urban societies in the southern Levant collapse during EB IV; this clearly has significance for the Chalcolithic period also. Undoubtedly, the scale was not the same as in the later periods, but the fact that people were already during the Chalcolithic period investing time and land planting olives, grapes and figs, strengthened the process of new economic forces such as the transmission of land ownership, social relations and the power structure between the sexes. Beams of olive wood have been found at Ghassul (Hennessy 1969; Bourke 2002) and Abu Hamid (Dollfus and Ibrahim 1988), clearly pointing to the early importance of olive trees, their products and secondary uses. Furthermore, as Fall (*et al.* 2002) indicates, the products of olives, grapes and figs could easily be converted into storable, transportable products, which were in great demand in other regions where it was not possible to produce these products. Clearly these processes and products were meant for the Egyptian market where there was a growing need for consumables and luxury products. Furthermore, there is, for example, a massive introduction of Egyptian wine jars to all parts of Egypt and to Lower Nubia. As noted in Chapter 3, there is evidence of fruit growing and advanced water management and cultivation of orchards at a number of sites in the southern Levant, including evidence of olive and fruits such as grapes, figs and dates. As neither grapes nor olives are cultivated in northeast Africa, they must have been imported to the region, probably from the Levant.

It is important that this expansion of orchard agriculture and other developments such as specialized pastoralism made it possible to transport these products over large distances. However, orchards demand planning and long-term investments to reduce risk, but are vulnerable should crops fail or be destroyed. Olive oil, wine and dried fruits, on the other hand, are all products of relatively low bulk that are easily stored, transported and therefore well suited for interregional exchange.

The Wider Inter-regional Setting

Sherratt's (1999:19–21) description of zonation may give a good illustration of the processes of differentiation and specialization that took place in the southern Levant and northeast Africa. Here, a system grows and differentiates, developing different zones of specialization, adding value to commodities as one gets closer to the developing centres in Egypt and Mesopotamia. In such a context, the southern Levant and Lower Nubia are economic supply zones where mobile and sedentary groups interact, simultaneously exploiting various economic and ecological niches, and, as Sherratt (1999:21) points out, patterns of local specialization appear. This would create various social identities and organizations as can be witnessed in the archaeological assemblages from Golan, the Jordan valley and the Beersheba region, where specialized sedentary groups interacted with mobile groups, exchanging commodities as well as manifesting their identities, as seen with the Nubian A-Group. In addition there is a trend towards the elaboration of material culture and more complex patterns of social circulation (Sherratt 1999:28).

The result is an exchange network and a symbiosis of groups of different adaptations and specializations. New identities and social organizations are forged, both in the Levant and northeast Africa. On a larger regional level of interaction, different groups create a bricolage of differences with a common basis of shared ideas, values and meaning. This may resemble

LOWER NUBIA		EGYPT		SOUTHERN LEVANT
A-Group → 3000/2900 BC		**Naqada / Madi → 3000 BC**		**Chalcolithic / EB I → 3000/2900 BC**
Copper artefacts	?← →?	Copper artefacts	←	Supply of copper
Gold	→?	Gold	→?	Gold
Mace-heads	→?	Mace-heads	←	Mace-heads, from northern Levant via southern Levant
Ivory	→	Ivory	→	Ivory, may also come from north Syria
Wine and olive oil	←	Wine and olive oil, may also come from areas west of Egypt	←	Wine and olive oil
Wool	?←	Wool	?←	Wool
Obsidian, from further south	→	Obsidian	←	From Anatolia via southern Levant
Basalt	?	Basalt	←	From the southern Levant, at least to Maadi
Timber	?	Timber	←	Timber
Lapis lazuli	←	Lapis Lazuli	←	Via the southern and northern Levant, from Afghanistan
Carnelian	?	Carnelian	→	Carnelian
Moderate specialisation & hierarchy		**Increased specialisation & hierarchy**		**Moderate specialisation & hierarchy**
Agro-pastoral (nomadic?) basis		**Sedentary agricultural basis**		**Agro-pastoral and nomadic basis**
Formative periphery – "middle-men"		**Gravity centre / formative centre**		**Formative periphery – "middle-men"**
Supply zone / sphere of interaction	→	**Accumulation area**	←	**Supply zone / sphere of interaction**

Figure 7.4 Materials, economic basis and their role in the growing interaction.

a pattern in Swat described by Barth (1956), where agriculturalists and nomads interact in symbiosis within the same region. The point in this case is that the 5th and 4th millennia reflect a number of social changes brought on by demographic changes, minor changes in the climate which allowed expansion into new regions, the development of specialized pastoralism, and interregional contacts and exchange with metal, transportation, secondary products and occupational specialization, etc. (see Fig. 7.4). A vital change here would be that the control over trade routes would gradually shift from the pastoral nomadic societies to a sedentary agricultural society (Trigger 1985).

The societies of the southern Levant and Lower Nubia must therefore have been engaged in an accelerating trade in consumables, where they indeed functioned as a supply zone to the growing demands and 'markets' in Egypt (cf. Sherratt 1999). Metalworking was already in its formative phase during the Chalcolithic of the Southern Levant which was probably engaged in the long-distance trade of metal artefacts, as may be seen by the exceptional hoard of Nahal Mishmar along the Dead Sea. On the other hand, local metal-working did not

really advance until the Early Bronze Age. This is exactly when there is a change in the form of trade. These societies lose their basis and disappear at the end of the Chalcolithic period, while Arad and other sites along the Mediterranean coast appear in the Early Bronze Age. This also initiated a much more direct large-scale trade with sites in the northern Levant such as Byblos. However, one has to keep in mind that the scale of trade during the Predynastic and Chalcolithic period was on a small scale compared to the EBA, while the *nature* of the exchange was trickling slowly down towards the centres of gravity in the Nile Valley, probably through several chains of both settled and nomadic societies (see Fig. 7.1 and Fig. 7.2). In this way these different modes of living interacted and were made sustainable with the exchange of goods and consumables that they did not produce themselves. This system of exchange was not integrated, as there were independent groups who operated the exchange of various forms of goods which flowed in small quantities. The transition in this system came with the establishment of the first dynasties in Egypt and Uruk, and it lost its leading role around 3000 BC. Warburton (2001:202) has suggested this opened the way for a development of independent and interconnected economic systems, in a totally new and different way, though the basis for this is to be found in the 5th and 4th millennia BC.

With the increasingly rapid processes of social complexity developing in both Mesopotamia and Egypt, the southern Levant and Lower Nubia were, to a large degree, also affected by being pulled towards these centres, which created the economic basis for interregional contact and exchange.

Among Big Men and Entrepreneurs

In the preceding sections and chapters it has been argued that during the Chalcolithic period, the southern Levant and the Nubian A-Group were societies which grew, expanded and developed on the basis of growing demands in Egypt, increasing possibilities of interregional contacts and exchange. However, there must also have been factors within the societies themselves which made this possible. It has been suggested that the location along the Nile to the south of Egypt apparently played a vital role with reference to the Nubian A-Group, while the sites in the Beersheba region bordering the deserts to the south were vital for connections to Lower Egypt. Both the Nubian and the Chalcolithic societies in the southern Levant may be described as entrepreneurial societies, where certain people gained prestige and influence that affected the whole society due to its tribal and egalitarian background or influence. The implication would be that certain families would be able to control the passage of grains, wine, beer, and various forms of foodstuffs, minerals and other luxury items. In both these cases, the societies acted as middle-men in a larger inter-regional setting with the demand for consumables as well as materials connected to a sphere of luxury and status. Under the circumstances of change in the natural environment, pastoral nomads represent a flexible and dynamic subsistence pattern, where changes in the natural environment can easily be incorporated.

In this context, the Nubian A-Group may be described as pastoral nomadic 'Big-Men and Women', who saw the potential of the new demands in both Upper and Lower Egypt in the late Predynastic period. This system is based on solidarity to the lineage or family, but also to a high degree of individual competition among different big-men participants competing in different areas. This is a principle based on authority where the big-man must constantly feed his supporters in order to maintain authority. Some individuals became influential during

their lifetime through the power of exchange and trade. Over time it is possible that this social system was transformed into a political system based on a permanent, structured hierarchy and hereditary positions. In a chain of exchange they were raising the 'cost' for the Egyptians, but by 3000 BC the Egyptians saw the possibility of reducing this 'cost' with a more direct exchange and exploitation, not through the Nubian A-Group as they had previously done.

Possible Routes of Exchange and Early Trade

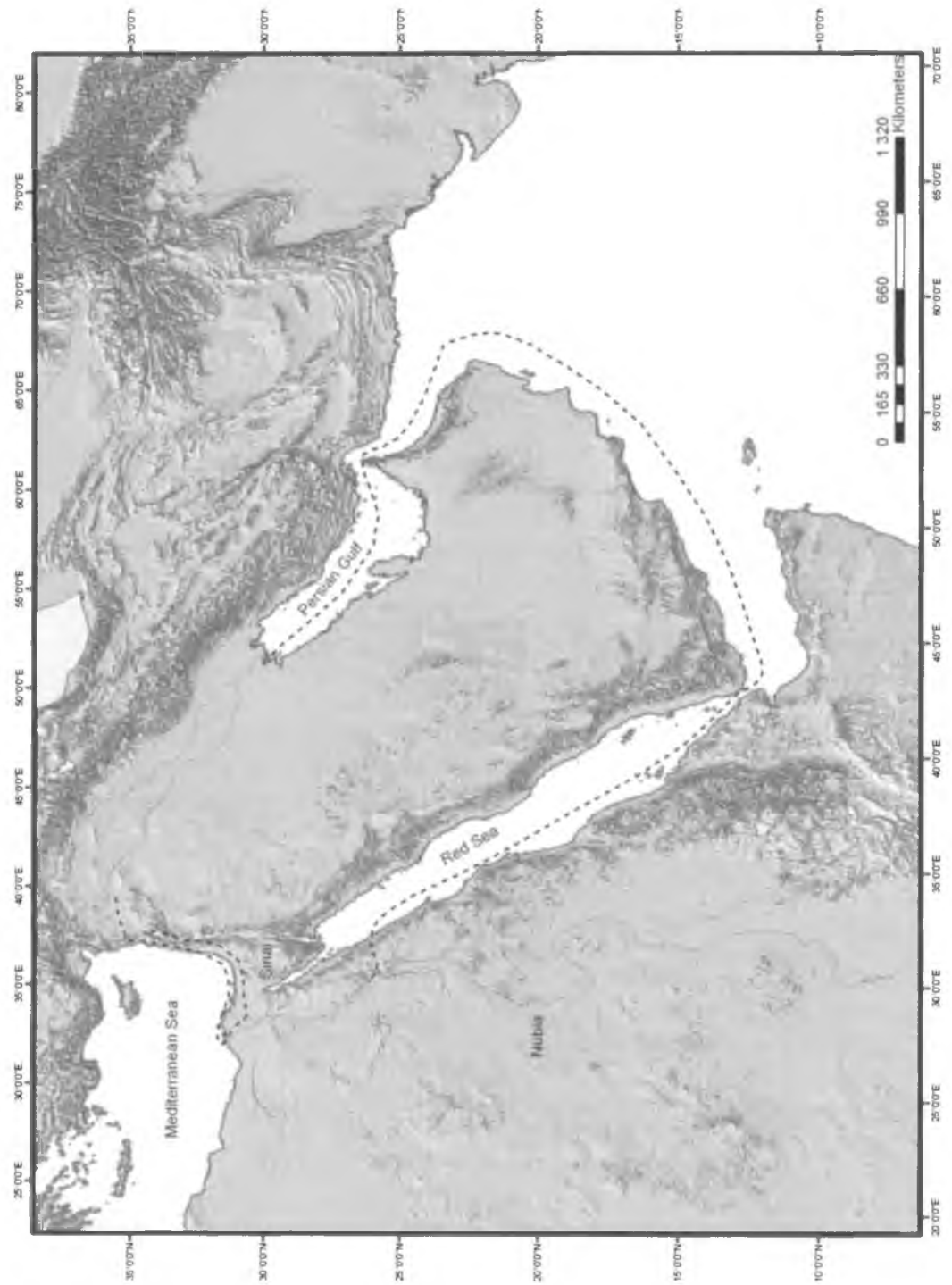
As argued here, pastoral nomads play a significant role in the 5th and 4th millennia BC and this would therefore imply that overland routes were important, although it probably changed in the late 4th and early 3rd millennia BC. Yet Redford (1992:20–2), implying the region has a rather backward culture, has maintained that in the late Neolithic and the early Chalcolithic there was little or no contact between Egypt and the southern Levant. He also casts doubt on an inland trade corridor via the southern Levant, viewing sea trade as the most favourable although there is little or no evidence of seafaring.

For a long time, researchers (e.g. Frankfort 1924; Kantor 1942, 1944; Baumgartel 1947; Mark 1997 and others) have supported early contacts between Mesopotamia and Egypt. Generally there have been two main routes proposed (see Fig 7.5): either an overland route through the Levant, or a direct sea route through the Persian Gulf into the Red Sea and crossing overland from Wadi Hammamat to Naqada (Mark 1997:3–5).

The seafaring route would imply good technological along with practical knowledge and is at least possible after 3500 BC. The overland route through the Levant is much shorter, less risky and could be used at a much earlier stage when specialized pastoralism had developed making it possible to access the large arid regions. The first half of the 5th millennium was also a major subpluvial phase in Arabia (Potts 1990:20–1), conditions suitable for overland contacts. Mark (1997) has suggested the trade and exchange transition over the millennia as first being influenced by northern Mesopotamia overland to Egypt, changing later to southern Mesopotamia and a possible sea route around the Arabian Peninsula to Naqada, and during the late 4th millennium and early 3rd millennium BC changing again to northern Mesopotamia with a probable seafaring route from Byblos to the Nile Delta. However, the regional contact along the coast would be kept and intensified by Egypt in the 3rd millennium (cf. Oren 1973; Gophna 1987). In general, Mark's (1997) focus on the sea connection has a major drawback in that he does not consider *how* the overland trade is facilitated. For the purpose here, it is especially the first phase of overland trade that is significant, along with the fact that the southern Levant plays a significant role in the early connections between northern Mesopotamia and Egypt. This may in fact explain why tokens are found at a number of Chalcolithic sites in the southern Levant including Tell el-Mafjar.

Approaching the 5th and 4th Millennia—Systems in Formation?

It is neither possible nor the intention of this thesis to apply the concept of world-system theory. However, the intention is to propose that the region *became* or developed to become a system during the 5th and 4th millennia. During the late 5th and the 4th millennia, there were probably several small, but important core areas in the Levant and northeast Africa, such as Lower Nubia, Upper Egypt, the Beersheba region and the Lower Jordan Valley with sites, like Tell el-Majfar, Tell el-Sultan (Jericho) and Teleilat Ghassul. It is likely that these small core areas had a periphery supplying these small regions and that they were



Figures7.5 Possible trade routes 3500–3100 bc (after Mark 1997:4, Fig.1).

probably politically, socially and economically dominant. During the 4th millennium with the accumulation of power, demand, etc. in Egypt, however, these regions were not simply pacified and dominated by Egypt and their demands. They became actively engaged in the exchange and economic possibilities that appeared, as well as the cultural exchange that occurred. During this formative period of Predynastic Egypt, there were greater mutual dependencies between the separate regions. In Predynastic Egypt there is a number of features that were not comparable to a formative world-system. First of all, Predynastic Egypt did not have a large-scale and diverse economic basis, although it was growing throughout the 4th millennium. Neither did it have a pool of free-wage labour specializing in the manufacture of valuable finished products. In the southern Levant and Lower Nubia the economies were not mono-cultural, but they were probably slowly more integrated into the developments of Predynastic Egypt throughout the 4th millennium, providing more and more raw materials, as well as finished products to the growing demand. Neither did the regions differ significantly in terms of centralization. In this way the southern Levant and large parts of northeast Africa may be seen as a single developing unit during the 4th millennium, bound together by local elites supplying the formative core area of Egypt with goods and raw materials from the fringes or peripheries. There are no clear boundaries, but both the southern Levant and Lower Nubia are acting as local accumulation zones, as they have access to a wider array of materials and items of great demand in Egypt, which is especially seen during the latter half of the 4th millennium (cf. Fig. 7.5). This may not only have had impact on an economic level, but also on ritual and structural features in the social organization with a growing emphasis on difference and inequality. The importance of this perspective in this context is that it forces attention to social interaction within a broad geographical region, although the economic dimension is generally given priority, even if societies may have other relations and connections than commercial ones (Edens 1992:121). In fact in spite of there being a strong commercial connection, this would still imply that people had contact and interacted, although the contact in this formative period probably had extremely little 'economic value' on a large-scale compared to later periods.

Initially, the world-system theory of Wallerstein (1974, 1980, 1989) was based on historical Europe with a focus on the impact of capitalism, both as a major mode of production, as well as setting the premise for other different modes of production. As per Wallerstein (1974), the pre-capitalist world-systems were ephemeral with either the possibility of quickly collapsing or transforming into a world empire. During the 4th millennium Upper, Middle and Lower Egypt were developing as centres of gravity, due essentially to large demands for luxury goods from both the southern Levant, the Lower Nubia and beyond. This had been possible through a growing social and economic difference and the control over irrigation systems, as well as the establishment of trade routes to the south, east, west and north. This is in part how the development or disappearance of societies of northeast Africa and the southern Levant in the 5th and 4th millennia may be viewed. Only Predynastic Egypt developed into a pre-capitalistic system, while both the Nubian A-Group and the Chalcolithic societies of the southern Levant disappeared. From several small systems this was now being integrated into one large system, existing and developing along with other formative systems such as Mesopotamia. These relationships between the developing core areas and their periphery were probably to a large extent much more dynamic in terms of exchange and influence going in mutual directions, as opposed to a 'colony perspective'. Wallerstein used centre

and periphery (as well as semi-periphery) in order to describe the core areas and the areas where the economic development was dependent on the core area demands. This implies that the periphery is greatly dependent, at least in economic terms, on the core area. However, this was probably not the case with Lower Nubia and the southern Levant, as the insistent Predynastic Egypt was still in its formative period, not becoming formalized until after 3000 BC with its growing need for expansion and control over resources. To a great extent the world-system system focuses on production, exchange and demand or consumption on a regional and interregional level structuring inequality. This is a slight paradox as the theory in essence describes a capitalist setting. Thus it has obviously only general limited application and utility on pre-capitalist societies.

Fattovich (1997a:479) has argued that an embryonic interregional exchange network was already established between the Horn of Africa and Arabia from the 7th to 4th millennia, where obsidian resources in Eritrea and Djibuti were especially important (Zarins 1990), lasting to the end of the 4th millennium. During the second half of the 4th millennium there was a strong Egyptian expansion of contacts as far south as the Horn of Africa (Zarins 1990; Fattovich 1997b). Lower Nubia and what has been classified as the Nubian A-Group were included at an early stage in this exchange, which also involved obsidian from Eritrea and Djibuti (Zarins 1996). Fattovich (1997b:480) mentions a bracelet made with *Xabcus purum*, a shell which has Indian origin, found in a Nubian tomb of the late 4th millennium, clearly illustrating this growing interaction and exchange. Similarly, Haaland (1999) has argued that the dispersal of sorghum played a vital role in the 'trickle trade' linking the Horn of Africa with Yemen, Oman and Indus.

This leads us to the extension and limits of such early and formative systems. Earlier, Abu-Lughod's (1989:34, fig. 1) view on world systems in the 13th and 14th century AD has been mentioned, where she identifies eight circuits or world systems. In this case during the 5th and 4th millennia there seems to be striking similarities in extensions and limits with the regions concerned here. Although the systems in the medieval period are totally different in content when compared to the 5th and 4th millennia BC, they are in fact regions that appear to gradually develop into an informal system of exchange throughout these millennia. In particular the Nile Valley and the adjacent regions to the east and west seem to be important, as well as large parts of the southern Levant and the Arabian Peninsula. Interlinked with this organization is the system developing in Mesopotamia where the deltas along the Nile, Euphrates and Tigris developed as cores in the succeeding millennia.

Throughout the 5th and 4th millennia interregional contact developed not only in the centre of Predynastic Egypt but also the peripheries. The periphery played an active and dynamic role in the formation of the first urban and territorially based states. Once these urban societies and states were formed, the discussion becomes different, with the domination of large parts of the Levant and Nubia, control over much of the exchange with these regions and a fundamental alteration in the long-distance exchange structure becoming more direct and technologically different from earlier (this issue will not be touched upon here). In fact the increased pastoral production may have provided the basis for social transformation that we see in the societies of both the southern Levant and northeast Africa, where migration and cultural contact became significant.

Growing Focus on Specialization and Ritualization

One important issue in connection with the growing interregional contact and exchange, and the introduction of metal, is whether this resulted in specialization whereby the new metal was incorporated into an already existing social structure, or if these changes and innovations demanded new structures and belief systems. This section focuses on the implications of the introduction of metallurgy (mining and smelting) with reference to scale, specialists and social transformation, as well as some of the implications of the metal with reference to ritualization and equality. Lastly, this is seen as movement towards increased complexity on a local level regarding entrepreneurs or big-men.

Scale, Specialists and Social Transformation

Mining activities in the southern Levant must be seen in a small-scale context, presenting a picture of organization as being fluid, temporal and of 'informal character'. Evidence from Feinan consisting of only a few pieces of slag and copper prills dating to this period may support the argument of a small-scale Chalcolithic metallurgy in the Beersheba region (Hauptmann 1990:56–7). As Knapp (1998:4–5) points out, mining is often confined to agrarian societies when people were for some reason unable to farm. This may also have been the case in the agrarian-based Chalcolithic societies of the southern Levant, but it does not explain why copper ore was brought 150–200 km to sites in the Beersheba region. Why bring copper ore to these sites? Mining communities are most often found in the proximity of the mines, depending on local determinants such as water, wood, etc. (Anfinset 1996; Knapp 1998:14–15). It is therefore also reasonable to suggest that pastoral nomads played a significant part in the mining of copper, possibly without having full technological knowledge of how to smelt and cast the copper. Technical analysis showing 'incomplete' slag from Shiqmim, the lack of the use of a flux and the obvious lack of knowledge of the process of separating copper from slag in the liquid state (Golden *et al.* 2001:955), would further support this premise. As Knapp (1998:15, with references) points out, it is not only technological innovation in and of itself that leads to major social change, but rather the social milieu into which such innovations are introduced that creates the change. Evidence of metallurgical activities, as well as metal artefacts over a time span of about 1000 years, clearly illustrates metallurgy on extremely small scale.

A low degree of craft specialization seems to appear in the Chalcolithic period as copper was not a common material and there is little variation in artefact types. In Egypt and Lower Nubia there is again little variation when referring to artefact type. In the southern Levant, a small number of apparently functional objects have been recovered, whereas the majority of the finds are confined to the non-functional group. One may then question the normalization of metal use (cf. Hanbury-Tenison 1986:151) as the actual number of 'functional' artefacts does not exceed 70 within a timespan of at least 1000 years. It is on the other hand possible that the metal artefacts were incorporated into both a functional and ritual sphere (cf. Anfinset 2000). Several 'utilitarian' artefacts such as the blade objects and awls may well have been engaged in a ritual sphere, both in connection with rites of passage and body decoration (see for example Nordström 2002, for the latter) while still maintaining functional qualities. As mentioned earlier, many of the blade objects do not appear to have been used at all. An interesting example of the placement context of 'functional' artefacts is found, for example,

at Meser (Dothan 1957, 1959b) where copper axes were deposited in the actual structures of the buildings. Although the dating of this site is contested, the placement of copper axes in building structures points toward the performance of rituals during the construction period. Copper standard heads have also been found as part of a foundational deposit in a wall of a large possibly public building at Shiqmim (Golden *et al.* 2001:958). This could continue to support the idea that 'utilitarian' artefacts were made at sites in the Beersheba region, but that they were part of a formative or exploratory period of metallurgy in the Chalcolithic period. The knowledge and technology may actually have been 'tested out' and introduced for the first time. The scale of production of copper does not point to a specialized craft, the case of occupational specialists, or an industry, but rather towards an experimental phase where the metallurgy and metal artefacts were introduced into a ritual and communal sphere. This is also supported by the smelting and casting contexts from sites like Shiqmim, where the evidence suggests a non-hierarchical and egalitarian society. Here, slag and ore were found in association with almost every architectural feature excavated at the site (Levy and Shalev 1989:362). Copper metallurgy does not necessarily indicate a ranked society, although metal and metallurgy are often used as an indicator of craft specialization. This is not to argue that craft specialization did not develop during the Chalcolithic period, but rather it seems to be limited and in a formative stage, both with reference to metallurgy and to the social formation of craft specialists. Regarding metallurgy the evidence from Abu Matar is indeed the largest and best, although it cannot be described as an industrial activity with large-scale production and standardization of items. Furthermore, the 'utilitarian' artefacts were much easier to produce than the mace-heads, sceptres, crowns etc., which must have been cast by the lost-wax method (*cire perdue*). In the southern Levant there is absolutely no evidence of this technology during the Chalcolithic period (i.e. broken moulds etc.) which could suggest the existence of local production. The lost-wax technology is a complicated method of casting, demanding special skill and knowledge (cf. Anfinset 1996). It is a method demanding occupational specialists on a high level and this is not found in the Chalcolithic period of the southern Levant.

By the end of the Chalcolithic period evidence of metallurgical activity disappears and the sites in the Beersheba region are abandoned. As noted by Ilan and Sebbane (1989:143ff), the character of the evidence of Early Bronze Age I differs both with reference to metal artefacts which spread northwards, and to metallurgy which disappears completely. This would also imply a different social organization from the preceding Chalcolithic period. The fact that only open moulds were used and that the lost-wax technique disappeared could also be employed as an argument for a local production of simple and relatively pure copper artefacts, with the import of complex cast and alloyed metals. This may support the idea that metal artefacts were largely connected to ceremonial and ritual activities and were symbolic of a rising elite. Central questions should be pondered: under what circumstances did this pattern of metallurgy develop? Why are there so few 'functional' tools, while the vast majority are determined to be 'ceremonial' objects? Why is the evidence of metallurgy so meagre? Considering the natural deposits in the region and the fact that there are only small quantities of metal artefacts from the Chalcolithic period recovered (excluding the exceptional Nahal Mishmar), why was the ore transported 150–200 km for smelting and not treated on the actual mining site?

Often specialization falls within an evolutionary frame of explanations, where there is more reference to economic and rational explanations in the technological process with emphasis

on rarity and standardization. Less attention has been put on the distribution of the actual skill and knowledge, or the social value of the objects produced. Another important factor is that when copper is introduced it needed to be socially accepted and adopted. Forbes (1964:69) notes that nomads or pastoralists treat the smith as a social outcast. This is not only because of the manual work, but also due to fear, however, this does not rule out a relationship as they would need the products. Similarly Davey (1988) suggests that the traditions of metallurgy evident in the 3rd millennium BC in both Egypt and Mesopotamia have their traditions from a nomadic and desert environment. The traditions themselves further develop into the urban context of the first civilizations. In other words they would not, even if they could, take part in such an enterprise due to social and cultural regulations. However, this would not discount the possibility of them collecting copper ore, but they would not be engaged in the manual aspect of the work which would be taken on by the sedentary population who often treated the smith in a completely different manner.

Golden (1998:322ff) suggests a stage with a purely utilitarian copper industry in the southern Levant, but at around 4000 BC one group of skilled craftsmen began to produce complex metal castings, developing a new class of goods, a production system and demands. He further proposes that the mace-heads may derive from the Feinan region (cf. Shalev *et al.* 1992), that the context of the complex castings (i.e. the hoard and settlement) points to a place of origin near by (cf. Levy and Shalev 1989), although there is no explanation as to why, and that there are no stylistic similarities elsewhere which implies local origin (cf. Beck 1989). However, a number of the mace-heads from Nahal Mishmar bear similarities to EB finds in Anatolia. The issue is then, what these similarities *really* mean. As argued earlier, there is scarce evidence of complex casting in the southern Levant, and one would further expect that this would have created an elite, accumulating and expressing wealth, although none of the graves from the Chalcolithic may be labelled as rich or wealthy. In fact, very few of the copper objects are deposited in graves, rather illustrating a different attitude towards the new metal. Tadmor (*et al.* 1995) has also pointed out an analysis of the stone cores of the mace-heads from Nahal Mishmar suggesting *different* sources, and there are various mistakes and errors on the castings suggesting *several* smiths. Moreover the complex castings illustrate both standardization and variation, but the matter of what these complex castings were used for remains unsolved. Tadmor (*et al.* 1995) argues for the Nahal Mishmar that there seems to be a lack of control repeatability, which may in fact suggest that the complex casting are on an experimental and formative stage of controlling the technological processes.

Growing Focus on Ritualization and Equality?

One feature that appears to develop in the southern Levant during the Chalcolithic period is temples and sanctuaries such as Ein Gedi, Ghassul and Gilat, all interpreted as the only public buildings of the period (Mazar 1992:68). Levy (1986:87) has argued that regional cultural groups develop based on social ranking and hierarchies. Here, chiefdoms develop on a local level where, among other factors, specialization and concern for territoriality are central aspects. Examples of an increased focus on ritualization and social differentiation are the organized villages, burials, cemeteries, and the wall paintings at Ghassul. Ghassul seems to be a cultic centre with emerging social complexity (Bourke 2002). Some of the earliest Chalcolithic copper artefacts come from Ghassul (Golden *et al.* 2001:951). In fact this may indeed point in the direction of a growing need for public rituals and organization in a time of great changes

and when the rituals and material culture are used to control these changes. These temples seem to be a mechanism for emphasizing the collective and public ideas of the larger community in a period with a greater focus on the individual, where there is growing emphasis and possibility for individuals to create social differences or inequalities than ever before.

Bloch (1992) has suggested in his analysis of politics in religious experience rebounding violence and the development of ritual importance among the Merina people of Madagascar, where rituals developed from a family level to become incorporated into the state religion. It is not the actual ritual which is of importance here, but rather the dynamic character of rituals in a general sense. This development was obviously a result of a historically specific development on Madagascar, but it also points to a general path whereby local and traditional elements are incorporated into state rituals as a result of growing political and economic complexity, legitimizing and institutionalizing authority. Similarly, Kujit (1996) has argued that the late Natufian and PPNA mortuary practices in the southern Levant functioned as social integration during periods of social, economic and environmental change. He particularly emphasizes the role of secondary mortuary practices and activities connected to those practices, which symbolically and physically emphasize social unity rather than social inequality. A similar argument may be put forward for the Chalcolithic period of the southern Levant, while the EB I—as well as processes in Predynastic Egypt and Nubia—shows a greater emphasis on social inequality connected to the development of social complexity.

Further, a lack of monuments in the Chalcolithic period may be seen as an indicator of a low-scale hierarchical system, although there is an apparent increase in social complexity. New forms of social organization and interaction, greater emphasis on resources and territory, burials and a growing craft specialization made it necessary to focus on collective rituals throughout this period. Indeed, metal artefacts were utilized as a central part of a social system which was gradually transformed and elaborated on, as exemplified by increasing social differentiation due to rapid cultural change and contact with formative societies in Egypt and Mesopotamia. Within this picture of early metallurgy in the southern Levant, ranked societies or chiefdoms seem to have developed (cf. Levy 1986, 1987, 1998a etc.). There can be no doubt that there are certain features in the archaeological material that suggest a more socially complex society, but indeed the southern Levant was already a culturally complex arena in terms of interaction between various groups, both settled and nomadic (Anfinset 2004). Within this framework of change, there was a tendency towards an increased social complexity (Levy 1986), but there was also an increased emphasis on ritualization with persons organized for ritual purposes (cf. Hocart 1955). Differences are reflected in various ways, both with reference to social identity and a broader cultural identity. Societies are differentiated and when greater co-ordination is needed, specialization is created. This specialization and social complexity is not seen in the southern Levant until the EB. Within this cultural area a great variety of differences exist, but there are also cultural similarities that were shared over a vast area in the Levant and in neighbouring regions.

Towards Increased Complexity

During the 5th and 4th millennia new institutions are created as trade, transport and division of labour change. This is no longer only performed within the context of a local social structure, but now also within specially organized groups. Long-distance trade has often been a major factor in the rise of centres, permitting the populations in 'poor regions' or 'peripheries' to flourish due to their position as middlemen. Once the complex societies in

Egypt and Mesopotamia were formally in place by the institutionalization of the dynasties, the impact these regions played on others was the result of a long process of maintenance and organization over the *already* existing network of relations and economic ties. As Ekholm and Friedman (1979:46 with reference to Wright 1972) argue with reference to the Early Dynastic period in Mesopotamia, this was also a period of formation of large walled cities developing from the preceding period with a much more even distribution of small settlements of varying sizes, probably organized in larger regional political hierarchies.

Considering the southern Levant, Golden (1998:341) has suggested that during the Chalcolithic, a culture for luxury goods was developed by a rising elite, including not only goods of metal, but also of ivory and basalt. Metallurgy and merging complexity need an exchange network to organize labour and an elite with broad cultural contacts. Golden (1998) therefore follows Levy in the premiss that the Chalcolithic may be interpreted as a chiefdom with craft specialization, long-distance exchange, prestige goods exchange, social stratification, redistribution and accumulation of wealth and surplus. Scham (1999) has argued that there have been two views connected to the Chalcolithic social complexity of the southern Levant: those who argue that the Chalcolithic was a chiefdom where specialized pastoralism was asserted (e.g Levy 1983), and those who argued that the Chalcolithic societies did not differ from the Late Neolithic centring around village farming, where pastoralism represented an insignificant role in the economic sector (Zeder 1991). However, Scham has clearly illustrated and emphasized the importance of pastoral production by identifying pastoral sites. The southern Levant is in this case a good example of the non-linear development of technology and social complexity, which seems to increase during the Chalcolithic period, while during the succeeding period EB I both the technology and the social complexity is less clear.

The political economies, which gradually developed in the 4th and 3rd millennia, had roots going back to the 5th millennium BC and these processes took place with growing centralization, the development of complex societies and the secondary products revolution.

The Social Value of Early Copper

Copper had an unmistakably significant social value once it was introduced in the late 5th and early 4th millennia BC in the southern Levant, Egypt and Lower Nubia. Metal, together with other possibilities of acquiring personal wealth and status at the cost of others, was based on the new interregional contacts. In the 4th millennium, this became possible for the first time with the development of societies with great social inequality based on interregional contacts. Copper was in the formative periods of the 5th and 4th millennia a medium of exchange in social and political transactions. A basic premiss for this reasoning is that the material culture expresses social or cultural values which are a reflection of people's ideas (Barth 1961). This may to a large extent explain the importance of copper and the symbolic meaning that rests in the copper itself. In this section, the significance of copper as a cultural expression will be considered in various contexts and its meaning in relation to these contexts.

The Introduction of Metal Artefacts and Smelting/Casting

Certainly the evidence from Shiqmim and the remainder of the Beersheba region does not suggest a metal 'industry', but rather an explorative and formative phase in metallurgy as argued earlier. It is questionable whether Syria and Palestine appear as independent centres

for early metallurgy (Childe 1957:224; see also Levy and Shalev 1989:352 for further references). Levy and Shalev have noted that there have been two avenues of interpretation of the metallurgical development of the southern Levant. Firstly, there has been the consideration of the development of metallurgy as an independent centre, and secondly, there has been a diffusionistic view arguing that metallurgy penetrated into the southern Levant from the northern part of Mesopotamia and Anatolia. There can be no doubt, however, that copper metallurgy was performed in the Beersheba region in spite of the smallness of scale, although it cannot explain the large hoard of Nahal Mishmar.

For Egypt and Lower Nubia the picture is obviously different and the knowledge of working with metal arrives later than in the southern Levant. Baumgartel (1947:50) argued that metalworking along with other technologies came with the Asiatic people who invaded the region comprising Egypt at the end of Naqada I. What seems more likely is the introduction of metal to northeast Africa from the southern Levant and particularly the Beersheba region and Sinai, where possible pastoral nomadic groups took part in this diffusion and development. In light of the metallurgical evidence and especially the recent work of Tadmor (*et al.* 1995), it seems likely that metal was integrated into a wider network of exchange and contacts over large areas, along with a number of other valuables and prized artefacts. What seems relatively clear is that copper artefacts seem to precede the smelting and casting of copper in both the southern Levant and northeast Africa. We may therefore outline the following development of metal and metallurgy in the regions discussed, where the introduction of metal and metallurgy develops first in the southern Levant and thereafter spreads to both Egypt and Nubia (see Fig. 7.6 and Fig. 7.7).

The Role of Copper

We have already discussed early metal and metallurgy as being part of a larger social setting where the artefacts were not only used as symbols or expressions of power, but may also have been part of an increased focus on equality, especially during the Chalcolithic period of the southern Levant.

Looking at the different depositional contexts of the Chalcolithic (Fig. 7.8), there are plainly some striking differences and changes that appear when compared to the later EB I, Lower Egypt, the Predynastic of Egypt and the Nubian A-Group. During the Chalcolithic, there is a focus on copper artefacts in settlement contexts while relatively little is deposited in graves. This might of course be due to both methodological problems, as well as recycling and looting. Graves from the Chalcolithic period are generally not known to contain copper artefacts with the exception of the more controversial contexts of Nahal Mishmar and Nahal Qanah, which must both be regarded as anomalies in this context. In the Chalcolithic period there is a relatively broad variety of forms and types present in the settlement contexts, the awl being the most common, but blade objects are also fairly common.

In the EB I (Fig. 7.9), there seems to be a clear shift both in type and depositional context, but there is apparently no real change in number if the Nahal Mishmar finds are excluded. However, there is a decrease in type of copper artefact, where the awl is still the most common type, followed by blade objects. Although a large number of awls have an unknown context, the burial context seems to dominate. The dagger appears as a new type found in small numbers with striking similarities to those of Predynastic Egypt.

In Predynastic Egypt (including the Badarian, Naqada I and II, Fig. 7.10), there is a relatively large number of copper artefacts when compared to the southern Levant and

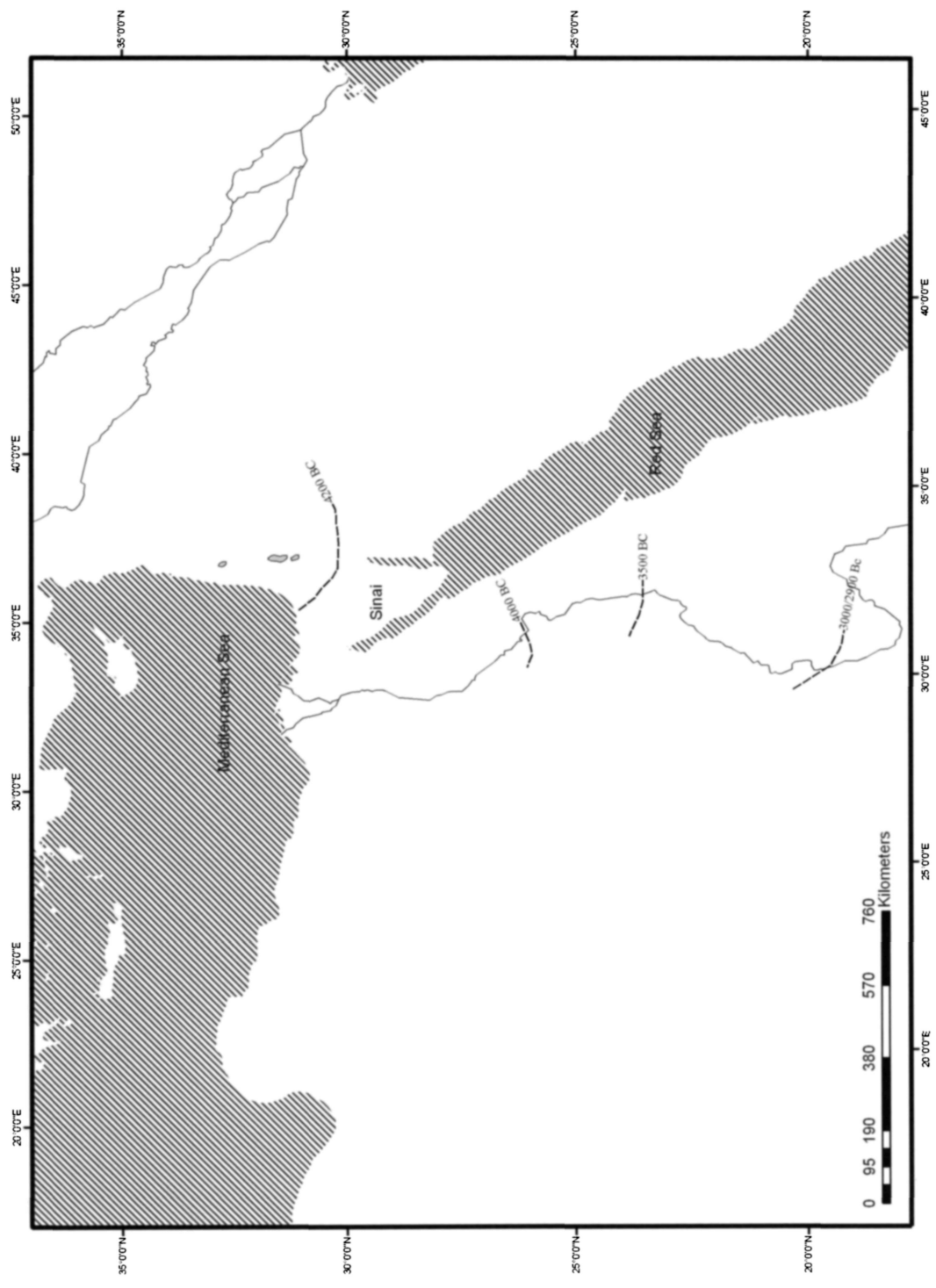


Figure 7.6 The spread of metal in the southern Levant and northeast Africa.

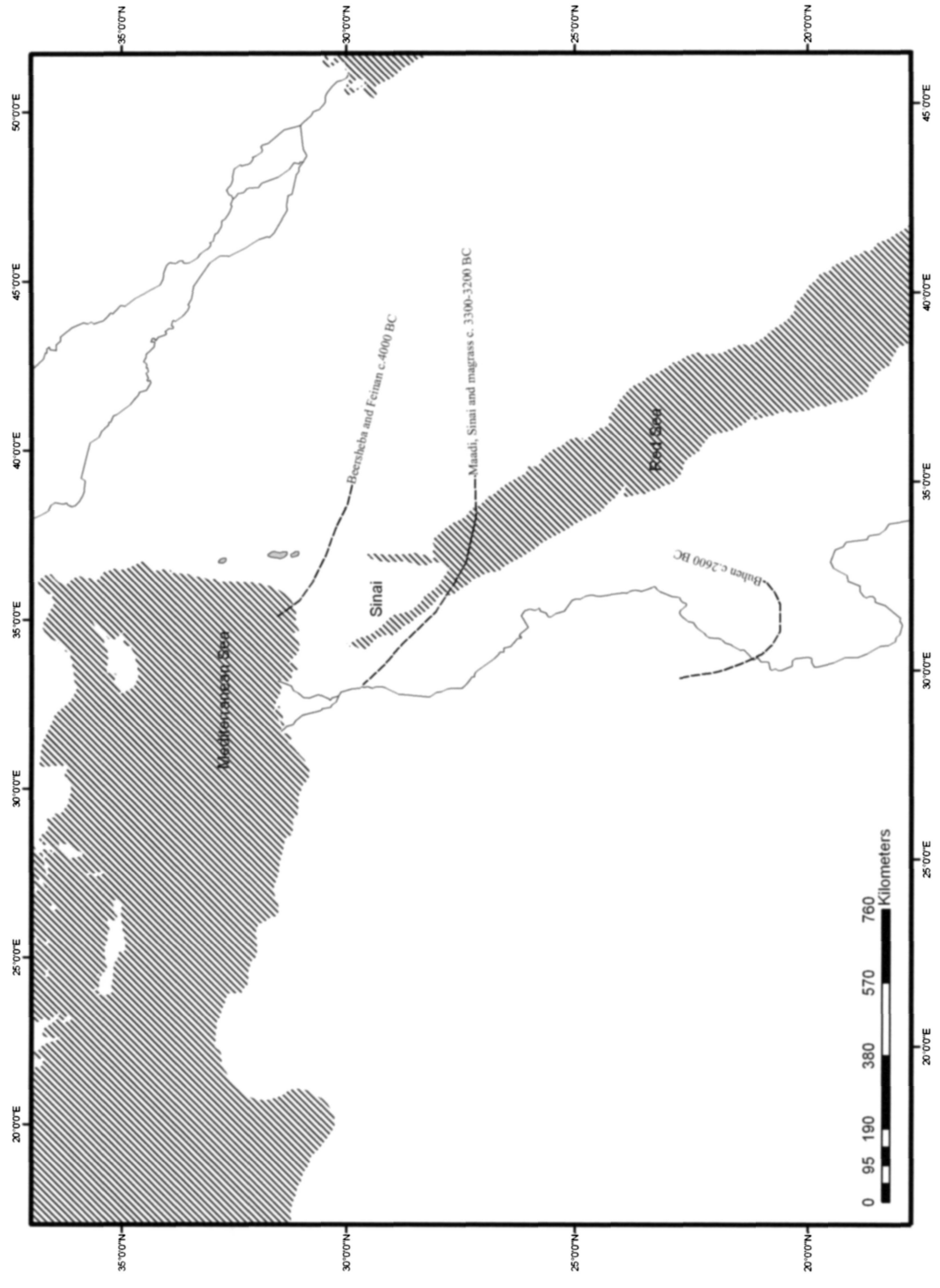


Figure 7.7 The spread of metallurgy in the southern Levant and northeast Africa.

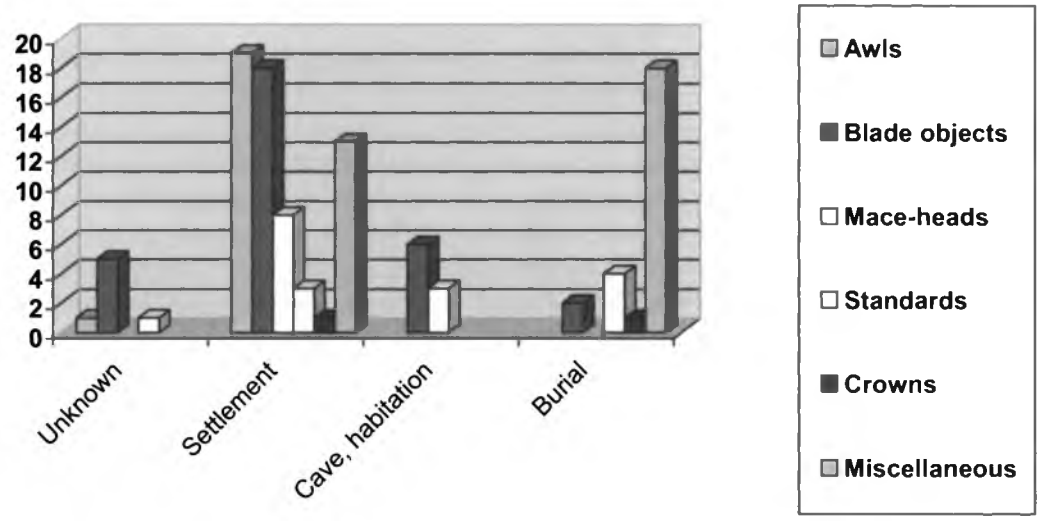


Figure 7.8 Copper in Chalcolithic contexts, excluding Nahal Mishmar.

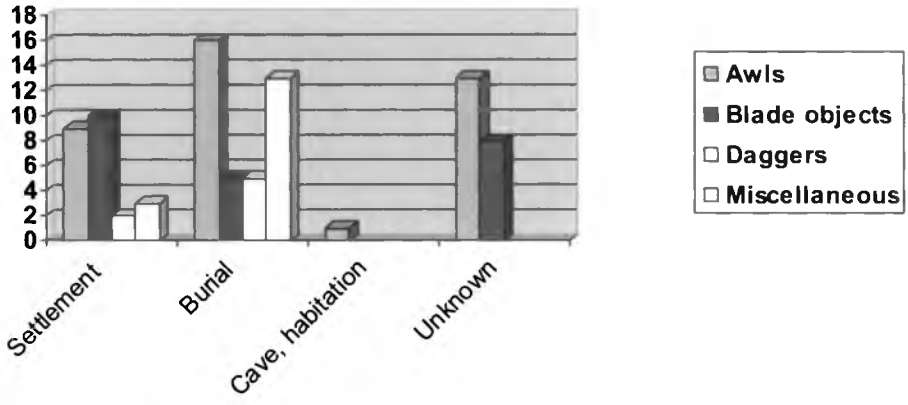


Figure 7.9 Copper in EB I contexts.

Lower Nubia, and this clearly seems to be a region where copper artefacts accumulate. The high number is worth noting, even when considering that both looting and decay may have been a large problem. There is also apparent emphasis on burial contexts, although this may be related to the low number of settlement sites known in the Nile Valley in general during this period. The miscellaneous category dominates, but there are also a large number of awls and blade objects.

The copper objects of Lower Egypt appear to be part of the Near Eastern complex, at least in terms of depositional contexts (Fig. 7.11). There seem to be similarities with the Chalcolithic of the southern Levant with an emphasis on settlement contexts. However, it should be noted that chronologically they are slightly later than the objects already cited above, and as already mentioned, relatively few settlement sites are known in the Predynastic period in general.

In the Nubian A-Group the tendencies seen developing during EB I in the southern Levant and Predynastic Egypt are even more evident (Fig. 7.12). Most of the artefacts are

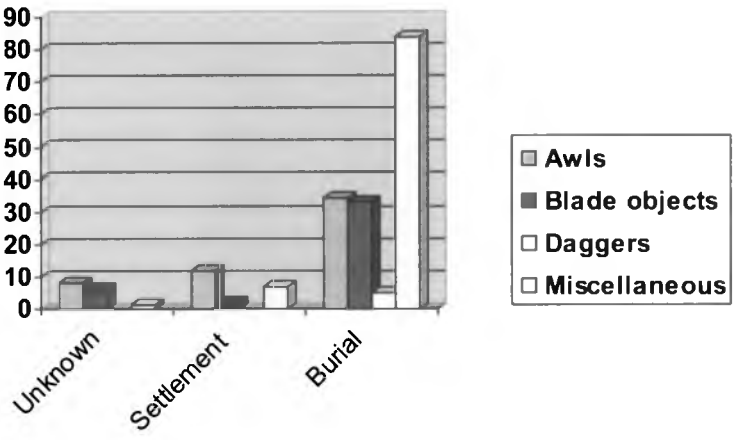


Figure 7.10 Copper in Predynastic contexts.

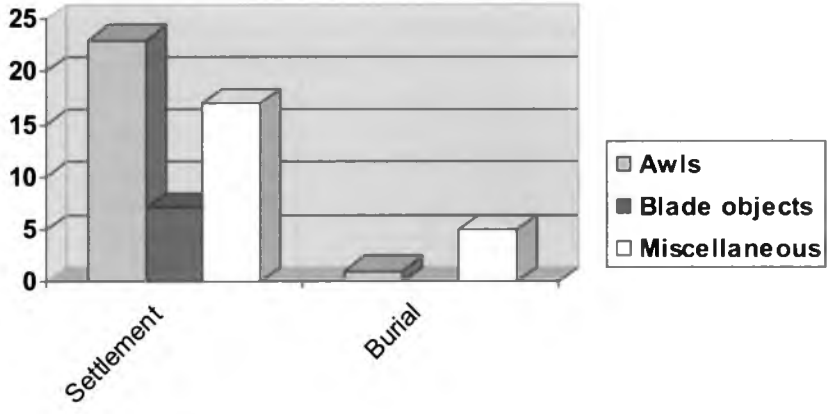


Figure 7.11 Copper in Lower Egyptian contexts.

found in grave contexts and the most common type is the copper awl. It is also striking that the number of copper artefacts from the Nubian A-Group does not especially differ from either the Chalcolithic or the EB I of the Levant. In Lower Nubia there is a reasonably clear division of the copper artefacts deposited in graves of the Nubian A-Group. A prominent feature of the contextual circumstances of the female burials is that, in addition to bracelets, stone mortars, grinders, etc., there is a combination of copper awls and one or two quartzite palettes (Nordström 1996, 2002), while the male burials contain copper tools such as adzes, axes and knives in addition to other funerary remains.

In considering some cross-cultural similarities there is a number of parallels that may be detected from the above data which are also recognized in the ethnoarchaeological and ethnographic studies, particularly the importance of copper in general and how it is treated, as well as ideas connected to the actual transformation of the metal. In his book 'The Gift' (1990), Mauss describes how the Häida and Tinglit Indians of the northwest coast of America had the knowledge of smelting and beating out copper. He writes, 'yet above all it is the emblazoned copper objects that, as basic goods for the potlatch, are the focus of important belief and even of cult' (Mauss 1990:44). For the Tinglit Indians, copper is identified with

Figure 7.12 Copper in Nubian A-Group contexts.

the sun because of its red colour (Mauss 1990:44, n. 239). Mauss (1990) points out the significance of copper among the northwest coast Indians in various contexts such as potlatch, myths and rites of passage. Copper among the Tinglit and Häida signifies wealth and good luck which is passed on by giving it away (Mauss 1990).

Copper and iron artefacts in Zaire have, on the other hand, been connected with power and prestige, as shown by Herbert (1984) and Childs (1991). Herbert (1984) has argued for the economic, social and ritual importance of copper in Africa. Although her study of copper tends to be too concerned with the economic aspect, it clearly shows the symbolic importance of copper as well. In various parts of Africa, copper has been used as a currency; many copper items have had ritual significance and it has also been an important marker of status and rank. Herbert (1984) even argues that copper had a higher value than gold in certain parts of Africa. Mauss (1990) also mentions the importance of copper as currency among the northwest coast Indians. Childs (1991:34) argues that copper ingots were a specialized currency in the Upemba Depression in Zaire, which was possibly also used in dowry transactions. Herbert (1984:209–10) writes with regard to Africa, 'the use of copper in many or in most contexts was part of the language of materials expressing values or beliefs integral to the culture in which the object was employed'.

This has striking similarities to Hindu beliefs where copper is regarded as a living thing. In the Hindu tradition, copper must be treated well, as it is regarded as one of the purest metals and is often referred to as Shiva Mahadevi (Anfinset 1996). In Nepal copper has a strong, spiritual effect and the metal is preferred for use in all daily activities instead of the cheaper machine-made aluminium vessels. The use of copper implements in the household is extensive in villages and hill areas, as it is difficult to transport imported goods over such long distances. Items made of copper are regarded as being of good quality and are long-lasting.

Although these contexts and descriptions are completely different in space and time, there are plainly some elements of general interest as the metal has an implicit meaning used in functional as well as ritual contexts. The copper is in this way personified with a meaning inherent in the metal which is profound and is present regardless of the context. A common denominator is that copper is connected to cosmological beliefs of creation and the purity of the metal itself. In returning to archaeological contexts it is necessary to consider both the

metal artefacts and the traces of metallurgy in northeast Africa and the southern Levant as connected to ritualized activity, as well as the objects used in the growing need to express prestige and wealth.

Metallurgy, Power and Control

When the technological processes and the social impact of these activities is considered, there is a potential for power and control connected to the transformation of the ore into metal, as well as the actual use of the metal objects. This would also imply that activities connected to mining and smelting were imbued with rites and symbols which would legitimize the work and emphasize the role of the products. Obviously this action creates social differences which are accepted by others as well. However, the social significance has definite impact on how the artefacts are used beyond the initial production. To a large degree many of the early copper artefacts do not seem to be used. Although the practical and functional aspects should not be underestimated, copper has properties and qualities superior to other materials such as stone. The artefacts may well have had a practical and functional part in one context, besides being ritual or symbolic. The copper awl is a conspicuous example, being used in the southern Levant, Egypt, as well as in Lower Nubia. Several (Levy and Shalev 1989; Levy 1998; Golden 1998) have suggested that knowledge and access could be manipulated in order to control the spread of metallurgy. Especially with reference to what is regarded as the complex castings of the southern Levant, Golden (1998:144ff) further suggests that this represents socially marked goods due to deliberate restriction of circulation, rarity and contexts, where certain individuals or groups had the possibility to restrict access to the new commodity, the metal, by controlling the raw material, production and circulation.

Evidently there are aspects of metal and metallurgy which may be used in social strategies to increase power and control. Both the metal and the profession had to be institutionalized, regardless of being implicit or explicit. During the late 5th and large parts of the 4th millennia, the metal and the profession specializing in smelting and casting were probably gradually institutionalized as seen in the evidence from the Beersheba region. The evidence from the Early Dynastic period with slag and crucible found in the royal tombs at Naqada, may in fact point in direction of control of metallurgy as well as its ritual significance. This implies that the copper may have both a functional as well as ritual purpose, with a gradual construction and reproduction of the significance of the metal. Obviously the social function and the social implications of this transformation increase the significance of the metal and the technological processes as well as the symbolic value of the metal. This may create a social distinction on two levels: those who know the smelting and casting of copper or metal, and those who have the possibility to use these copper objects in order to create a social identity where rituals play a significant role as confirming apparent 'true' differences and distinctions. In this way the cosmology or ideology functions to explain and control the rituals in addition to the social and physical transformation of the metal. The growing specialization and social differentiation based on metal and metallurgy, along with other major changes and innovations, are clear potential sources of power and control in these early formative societies of northeast Africa and the southern Levant.

Concluding Remarks

In this chapter it has been argued that there is growing interregional contact involving the arid regions to a much larger degree than ever before due to the specialized pastoral nomads. This is observed not only in the southern Levant but also in Egypt and Lower Nubia, where a number of different modes of contact may be presumed. It is significant that in these processes not only copper is integrated into an exchange system but also other raw materials and artefacts, such as gold, obsidian, lapis lazuli, turquoise, carnelian and wool. This, together with a growing awareness and emphasis on orchards and agricultural products, generated increased interregional exchanges throughout the 5th and 4th millennia, possibly facilitated by entrepreneurs and big-men (and women), who operated on the fringes of Predynastic Egypt, particularly in the arid and semi-arid zones, facilitating and providing for the increased demands in the Nile Valley. The overland 'trade routes' are especially important, though these changed several times due to technological innovations and shifting political centres. Here are the contours of what may be described as a 'formative system' where interregional contacts are developed and established, although they are not fully developed until after *ca.* 3000 BC with the first dynasties in Egypt and Mesopotamia. What may also be detected in this sense is a growing focus on both specialization and ritualization, in all likelihood to better cope with the major social and technological changes, though in the end still leading towards increased complexity. Lastly, the introduction of copper artefacts, as well as the introduction of metallurgy at a later stage, plays a significant role in these processes, being gradually introduced and deposited in burials as expressions of wealth and contacts. It is interesting that the copper seems to have some cross-cultural similarities when considering transformation, properties and use, though there is a great potential in the metal and metallurgy to express power and control.

8 Conclusion

Although the focus and approach has been wide, the aim here has been to identify some of the cultural changes that took place in the southern Levant and northeast Africa during the 5th and 4th millennia BC, based on the view that the societies of these regions gradually developed more closely related links and ties over the millennia. By using such a wide approach and by focusing on interregional interaction and cultural contact, a better understanding of the regional processes may be perceived and it may in fact also aid understanding of the regional differences appearing.

In Chapter 3, it was pointed out that there were several differences in the chronological division and periodization of the 5th millennium, as well as the first half of the 4th millennium, while in the EB I there were only minor discrepancies. The sites that are taken into consideration are important when using a specific terminology and chronology. During the Late Neolithic, there seems to be a gradual economic specialization both regarding animal husbandry and agriculture, as well as some indications of contact with the northern Levant. This is developed and refined throughout the latter half of the 5th millennium and the 4th millennium BC, as witnessed by the establishment of relatively innovative societies and the major social, technological and economic changes seen in the development of specialized pastoralism and metallurgy. During EB I there appears to be increased focus on pastoralism with continued better contacts with Egypt to the south, although there are also some indications of contact with the northern Levant as well.

In this context, there was probably a gradual development of **specialized pastoralism** both in northeast Africa and the southern Levant as part of the growing demands, the natural environment and social changes. Pastoralism is a dynamic response to environmental and social conditions and not necessarily a regression back halfway to the stage between hunter-gathers and cultivators. Therefore, as pointed out in Chapter 5, there are several reasons why a nomadic way of living should to a stronger degree be incorporated into the changes and interactions that take place. The Chalcolithic societies of the southern Levant had their economic basis in the Neolithic period. Impressive changes occurred in food production and the mode of living in the preceding millennia. Population growth and changes in the

natural environment made it necessary to develop new strategies of exploitation with regard to secondary products, the development of specialized pastoralism, methods of irrigation and water management. Different adaptations appear to develop in the southern Levant and northeast Africa. In the former region sheep and goats were important, while in northeast Africa cattle in particular seem to be important at an early stage. As new and more marginal areas were taken into use, there was an increase in interaction with groups of different economic basis. This may reflect a pattern of cultural bricolage or a pattern of symbiosis where these societies functioned as 'middlemen' and entrepreneurs. In this connection, contact zones between settled and nomadic societies played a significant part in the existence of the villages. This was revolutionized when the early dynasties of Egypt developed large-scale marine transport along the eastern Mediterranean coast with a strategy of more direct exchange and control over the resources. A consequence of this is exemplified by the societies in the Beersheba region, and slightly later in the Nubian A-Group, which did not manage to cope with these changes and eventually disappeared.

It seems likely that pastoral nomads must also have had a part in the early introduction and exchange of the raw materials connected to the early use of **metal and metal production.** It appears to be relatively clear that the origin of metal and metallurgy in these regions was closely connected to the developments further to the north. Although this is also connected to wider socio-economic changes, the Chalcolithic and EBA societies of the southern Levant are integrated into a broader exchange network. In this region, copper ore and copper objects were probably exchanged by pastoral nomads with settled agricultural societies in the Beersheba region, the Jordan Valley and Lower Egypt, who prized the copper artefacts much more highly than the pastoral nomads. Hence there is a gradual change in the deposition of the copper artefacts, particularly evidenced between the Chalcolithic and EB I of the southern Levant. Both metal and metallurgy arrive later to both Egypt and Nubia, but there is an increase in the deposition of metal artefacts in graves throughout the 4th millennium, clearly indicating the possibility of greater exchange activities and contact, with more focus on the individual rather than the communal. The character of the copper artefacts in Egypt and Nubian are clearly different from the Chalcolithic of the southern Levant, both in terms of technology, composition and type. In addition the individual seems to be emphasized. However, there are types, such as awls and blade objects, which may be of more common character. Nevertheless there is an unmistakable increase in the number of copper artefacts recovered from the Naqada II period compared to the preceding periods. There is a further increase in scale, type and refinement during the succeeding periods, which is totally different from earlier periods, with the exception of the EB I of the southern Levant (though not in scale). The emphasis on connections and interregional contacts is further supported by the metallurgical aspects of the copper from the southern Levant, as well as from Egypt and Lower Nubia, suggesting that copper was transported and exchanged over large distances, where particularly the arid zones seem to have played an important role. Here specifically the analysis of the Nubian copper artefacts may provide a basis for the greater understanding of these processes in the future when more analyses and material from Nubia and Egypt are available.

In the 5th and 4th millennia there seems to be a gradual division between specialized pastoral nomads and settled agricultural villages. Towards the late 4th and early 3rd millennium this is supplemented by the development of the first urban centres leading to the formation of the **classical division** with interactions between nomads, villagers and cities still known and seen in

the region today. This is clearly tied to social, economic and technological changes within the region where, in a larger context, both Nubia and the southern Levant may also be seen as supply zones based on varied agricultural adaptation and specialized pastoral nomads. Particularly the latter had 'low hierarchies' in terms of social organization, where complexity does not represent a high degree of ranking and stratification, but rather interaction and differentiation linking different groups together. The gradual growth of long-distance exchange was significant for the later development of Egypt, but also for a shorter period of time in Lower Nubia and the southern Levant as well. Here, the latter two regions in particular had the possibility to manipulate these early networks of exchange and the spheres of interactions, as these societies were to a high degree entrepreneurial. Both the expansion of agricultural communities and the existence of nomadic or semi-nomadic groups on the fringes of the arid zone reflect this diversity. In this way during the 5th and first half of the 4th millennium there existed a number of regional centres which attracted people and groups of various economic and ecological adaptations. As seen in Chapter 7, there seems to be a growing exchange and specialization where a number of raw material and goods are incorporated in a 'formative system', which changes and develops fully after 3000 BC. The social and economic processes that take place in Egypt in 4th millennium gradually and increasingly affect these. As in the case of the Nubian A-group there seems to be a gradual process of sedentation which is active all through the 4th millennium. Towards the end of this millennium Egyptian dominance or inference increases which again leads to a process of nomadization, where groups are dispersed over a large area. All these changes happen within a mosaic of different cultural characters, sharing a common basis of understanding. Here, pastoral nomads act as a dynamic component of diffusion and cultural change between different modes of subsistence. Settled village societies had created economic surplus, which made it possible to procure metal ore from nomads. These settled societies acted in turn as 'middlemen' because of their position as a supply and demand zone to the larger formative societies in Egypt and Mesopotamia. Although this position was vulnerable to fluctuations in exchange routes, innovations and small climatic changes, it changed with new and more elaborate trade connections and with the rise of urban societies in the Early Bronze Age. However, both the Nubian and the Chalcolithic societies of the southern Levant were entrepreneurial societies in terms of gaining prestige and influence through control over exchange contacts with formative Egypt. This had great effects due in part to their tribal and nomadic background or contact which made them flexible and dynamic to changes. These societies became middlemen in a larger interregional setting acting on the increasing demand for consumables, as well as materials connected to a sphere of luxury and status. This pointed in the direction of a growing specialization in a system of exchange between mobile and sedentary groups (cf. Sherratt 1999:15–16), in a context of differentiation and specialization taking place on the fringes of the gravitational centre of Egypt. Metalworking was already in its formative phase during the Chalcolithic of the southern Levant, a region that was probably already engaged in the long-distance exchange of metal artefacts as may be seen by the exceptional hoard of mace-heads of Nahal Mishmar along the Dead Sea. On the other hand the local metal-working did not really advance until the Early Bronze Age II. This is exactly when there is a transformation in the form of the exchange whereby the societies lose their basis and disappear at the end of the Chalcolithic period and EBA, while other sites along the Mediterranean coast, such as Arad, appear in the Early Bronze Age. This also initiated a much more direct and large-scale exchange with sites in the northern Levant such as Byblos. However, it must be kept in

mind that exchange during the Predynastic and Chalcolithic period was low-scale compared to the EBA. Moreover, the *nature* of the exchange 'trickled slowly downstream' towards the centres of gravity in the Nile Valley. It is likely this trickled through several chains of settled and nomadic societies, with interethnic / cultural exchange systems, where copper, mace-heads and ivory, etc. linked large parts of northeast Africa and the southern Levant together. Here pastoral nomadism functioned on a large scale, not only outside the sedentary societies, but also within them, creating a process-developing complex society in the Nile Valley which could not have taken place without the affluent and dynamic societies on the fringes.

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